NATURE MAGAZINE

MARCH

1927

35 CENTS

YEAR 3.00

American Nature Association Activities

ON every hand the American Nature Association Outdoor Good Manners Cartoon Contest is meeting with hearty commendation and cooperation. On this page is printed a letter which speaks for itself as evidence of the attitude of several of our leading cartoonists. We are particularly indebted to Mr. Zimmerman for his helpful suggestion, and to Mr. Hubbard for his cordial cooperation.

Accepting "Zim's" idea, we are pleased to announce the establishment of special prizes for amateurs and the extension of the period of the contest for that class of entries. The main object of the contest remains the same in that all awards will be made in either class for *cartoons best expressing the need of roadside beautification and directed against the various desecrations of Nature's beauties.*

In the professional class the three prizes of $100, $50 and $25 will be awarded. In addition membership in the American Nature Association will be given for all cartoons printed in *Nature Magazine.* This part of the contest closes April 1.

For amateurs new opportunities are offered. There will be prizes of $25, $10 and $5, with ten honorable mention awards of one dollar each. This part of the contest will not be closed until June 1.

In addition, the editor of *Cartoons Magazine,* Mr. Freeman H. Hubbard, has kindly offered to present free a year's subscription to each one of the thirteen successful contestants in the amateur class. As further testimony of its endorsement, the American Association of Cartoonists and Caricaturists will, through one of its officers, give free a technical letter of criticism and advice to the winners of the first three prizes.

The only other rules, applying to both classes are that entrants wishing their cartoons returned should enclose postage; that there is no restriction on the number of cartoons any individual may submit; and that the class of entry should be indicated—"professional" or "amateur"—clearly on the cartoon.

The judges of the contest are J. N. Darling (Ding), Dorman H. Smith, C. Kessler, R. Bruce Horsfall and Arthur Newton Pack, President of the American Nature Association.

All cartoons should be sent to: *Cartoons, Nature Magazine,* 1214 Sixteenth Street, N. W., Washington, D. C.

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AMERICAN ASSOCIATION *of* CARTOONISTS *and* CARICATURISTS

National Headquarters—Nichols Building
244-248 WEST 49TH STREET, NEW YORK, N.Y.

Jan. 6, 1926

Mr. Richard W. Westwood
Assistant Editor
Nature Magazine
1214 16th St., N.W.
Washington, D.C.

Dear Mr. Westwood:

It is my pleasure to inform you that the Advisory Board of the American Association of Cartoonists and Caricaturists has commended the purpose of the cartoon contest being conducted by the American Nature Association and earnestly desires that it be supported by the cartoonists of the country.

"Such a contest is constructive, educational and wholesome," says Eugene Zimmerman ("Zim"), president of the A.A.C.C. "You can quote me as indorsing it with sincere enthusiasm. I only wish that supplementary prizes were offered for cartoons by amateurs only, as it is of vital importance for the younger generation of artiststo start their careers with such ideals."

"The nature-cartoon contest is a great idea; I'm for it," says Rube Goldberg, creator of "Boob McNutt" and a vice president of the A.A.C.C.

Winsor McCay, creator of"Little Nemo," originator of movie cartoons, a member of our Advisory Board and the author of the leading article in the February issue of "Cartoons Magazine," is equally enthusiastic in praising the nature-cartoon contest.

Mr. McCay says: "I was born in a lumber town in Michigan and have always loved the outdoors. Why anyone should deliberately destroy foliage or litter a picnic-ground with rubbish is more than I can understand. We can't have too many cartoon contests designed to prevent that sort of thing."

With best wishes for the campaign you are conducting, we are, Very sincerely yours, Freeman H. Hubbard Secretary, A.A.C.C.

FHH:js

* * *

The Zephyr, monthly bulletin of the Outdoor Nature Club of Houston, Texas, comes to hand and we learn that the Texas Federation of Women's Clubs is actively behind the movement for legislation to restrict billboards on the highways of the Lone Star State. The Federation also requested the Legislature to confirm the mockingbird as the State Bird by appropriate legislative action. The Houston Club has been active in this endeavor.

* * *

Many delightful comments have been received on the wild flower pictures in color in the February *Nature Magazine.* In connection with this cooperation on the part of the American Nature Association with the National Wild Flower Preservation we call attention to the announcement of the Society relative to post card reprints of these and other wild flower subjects. This appears in the advertising columns.

* * *

The colored frontispiece in this issue was specially painted by our Art Director, R. Bruce Horsfall. The mountain in the background is Mount Hood, seen from Indian Mountain. In the misty fog at the mountain's base is a lake where, apparently, the eagle has been fishing.

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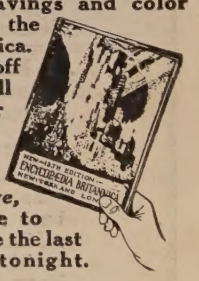

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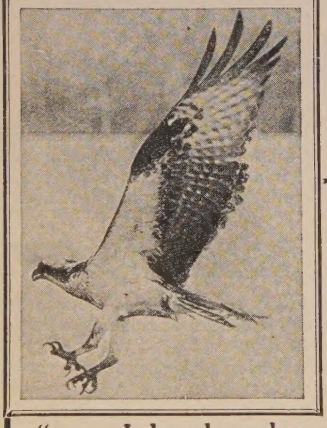

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15 Boudinot St., Princeton, N. J.

The Snakes of Iowa

A splendid new bulletin on the snakes of Iowa is recently off the press. It is a forty-eight-page paper profusely illustrated, dealing with the snakes of the state, most of which are more or less common through the East. An unusual summary of the fallacies believed about snakes is given at the beginning. Little or no sentiment for or against snakes as useful members of the state's fauna is offered. The straightforward presentation of the evidence for and against the various species is much more convincing than any other method that might be used.

Though the bulletin is, in a sense, technical it is so written that it may be generally useful to those desiring to know more about the twenty-five species discussed. Prof. J. E. Guthrie, the author, has to the writer's knowledge, had in his office a very large number of the species considered alive for the purpose of presenting first-hand information in the bulletin. He is to be congratulated on the excellence of the paper. The bulletin is No. 239 of the Iowa Agricultural College at Ames, Iowa.—E. L. P.

Chow and Bulldog

Have you a Chowchow or a bulldog? If so, do you know how best to care for them? The answer to the last question, if you must reply in the negative, is found in two little volumes just brought out by the Judy Publishing Company, 1922 Lake Street, Chicago. One, devoted to the bulldog and his upbringing, is the work of Walter E. Simmonds, and the other, on the chowchow, is the combined work of Edith L. Dietrich and L. Mae Davies. These little volumes are for the dog owner as well as the dog breeder. They sell for two dollars each.

Nature and Plays

Frequent requests are made of the American Nature Association for references to good Nature plays and pageants of general or special character. Just how extensive such a demand is, it is difficult to say, but that the supply is quite limited seems evident.

There comes to hand for review a volume entitled *Plays for School and Camp* by Katherine Lord, published by Little, Brown and Company of Boston. This volume appears to present in a workable and practical way six plays admirably adapted to the use the title suggests. The first one, "The Raven Man," can be classed essentially as a Nature play. This volume sells for $1.50.

Nature Magazine, however, recently made an attempt to round up other references of helpful character along this line. The results strengthened the opinion that the supply is limited and scattered.

The best work seems to have been done

(Continued on page 138)

A new Literary Movement is born

On the 17th of November—1926, a group of writers gathered in a high office on Fifth Avenue, and put into motion a stupendous new idea. For two years the idea had seemed a dream; but slow and careful work had made the dream into a reality, and there came into being the

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Theodore Dreiser

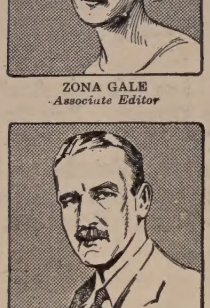
—greatest living American novelist—says:

"There must be thousands of people in the United States who now read good books occasionally but who would read them habitually if they had a chance. It seems to me that **The Literary Guild** will do a great deal to give them that chance, and I am heartily in sympathy with the undertaking."

CARL VAN DOREN
Editor-in-Chief

GLENN FRANK
Associate Editor

ZONA GALE
Associate Editor



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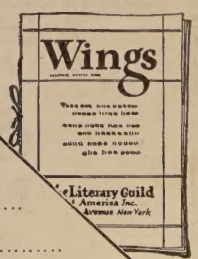

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Mr. Wm. P. Alexander, Educational Director, Buffalo Society of National Sciences.

Dr. Bertha Chapman Cady, Girl Scout Naturalist.

Miss Christina Carlson, Instructor in Nature Study at Rhode Island College.

Mrs. Anna Botsford Comstock, Prof. Emeritus of Nature Study, Cornell University.

Dr. Geo. W. Field, Consulting Biologist.

Miss Ruby I. Jolliffe, Supt. Camp Dept., Palisades Park.

Mrs. Jane Deeter Rippin, Nat'l Director of Girl Scouts.

Mr. Lester F. Scott, Secty. of Camp Fire Girls.

Mr. Julian H. Salomon, Scout Executive, Boys Scouts of America.

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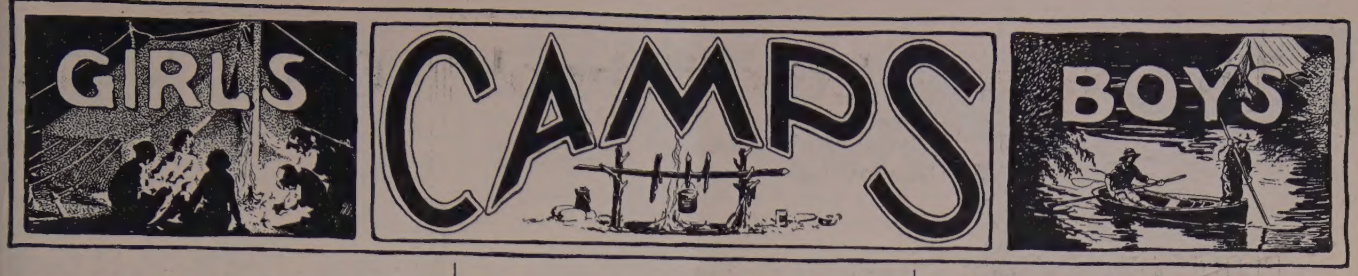

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The American Nature Association recognizes the importance of the summer camp in the conservation of the forests and wild life protection and believes that nature study is the fundamental key to good camping. It further recognizes that there is a scarcity of leaders who are able to put the idea across in the nature lore way. The Association has consequently made it possible for some of the camps who are really doing nature work to have the services of a nature guide.

We are able to announce at this time that **DR. WILLIAM G. VINAL** has been attached to the staff of the Association and will give his entire summer to NATURE SERVICE FOR CAMPS. This service will be in the form of a Lecture Tour. Dr. and Mrs. Vinal have planned to visit nearly fifty camps. We regret that only a limited number of select camps can be included in the itinerary but feel that a day spent in camp will be much more effective than a hasty visit.

Professor Vinal was recently president of the Camp Directors' Association and his work with various scouting organizations and camp circles is well known. It is a pleasure to us to make him available to the camp directors for the summer of 1927.

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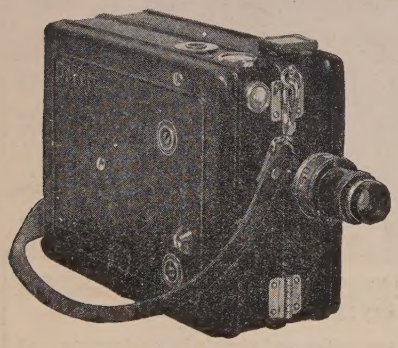

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(Continued from page 134)

in the direction of Nature operettas for children, several interesting productions being available. The John Church Company, 39 West 32nd Street, New York City, has available the following: "Near to Nature's Heart," a cantata with pianoforte accompaniment, 60 cents; "Flower Praise," a floral service for children, 30 cents; "The Festival of the Flowers," a cantata for children, 40 cents; "Harvest Time," an entertainment of verse, song and music for children; "Nature's Idyl," a cantata, 40 cents; "A Midsummer Night," a cantata, 60 cents; "Blossom Time," verse, song and music.

Also along the line of musical material, J. Fischer and Brother, 119 West Fortieth Street, New York City, list the following children's operettas; "Peter Rabbit," 80 cents; "Lady-Bug, Lady Bug," 60 cents; "Dame Nature's Tea Party," 60 cents; "The Verdict of the Flowers," 60 cents; "The Wedding of Daisy and Buttercup," 80 cents; "Butternut's Punishment," 75 cents; "Lily and Rosebud," 50 cents; "The Fairy Rose," 80 cents.

Oliver Ditson Company of Boston also lists in its catalog, which can be obtained on request, a number of cantatas and operettas, which, judging from their titles, partake largely of Nature action. Some of these, it seems, are adapted for production by children.

Coming to the field of plays and pageants without music, however, the available material does not appear to be extensive. The Education Division of the National Safety Council, 120 West 42nd Street, New York City, has four plays, which, while not primarily Nature plays, are for child acting. These are: "The Cracker Conspiracy," "The Hero," "Bill's Christmas Fright," "Bruin's Inn," all of which sell for 25 cents each. There is also a masque designed for school and playground and entitled "The Magic Crystal," selling for 30 cents.

The Penn Publishing Company, 925 Filbert Street, Philadelphia, has several plays for children. Most of these are based on Mother Goose, or mythology, although there is one, "A Garden Cinderella," which has a Nature motif. The price is 25 cents.

Of the various plays and pageants brought out by The Woman's Press, 600 Lexington Avenue, New York City, "The Conspiracy of Spring." 50 cents; "The Crowning of Spring," 50 cents; and "The Festival of Prosperina," 50 cents, seem to be the nearest to Nature plays.

Walter H. Baker Company, 41 Winter Street, Boston, lists several plays in its juvenile department which appear from descriptions to carry the Nature idea in part, but no special Nature Play classification is made. Rand McNally and Company reports nothing available along this line, as do several other publishers of juvenile material.

The foregoing is in the nature of a report of progress. Doubtless there are other published plays and pageants that have not come to our attention. The American Nature Association will appreciate it if the readers of Nature Magazine will report any such in order that they may be brought to general attention.

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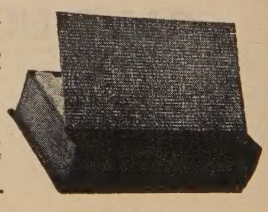


Teaching Health

A novel, remarkably interesting and obviously effective approach to the problem of health-teaching for the youngsters is to be found in *Children of Grizzly*, written by Sadye Madalene Hageman in collaboration with Alfred O. Shedd. It is published by the World Book Company, Yonkers-on-the-Hudson, New York. The book derives its title from an Indian legend which makes children of the red men "children of the grizzly." Each chapter develops one or more health thought, yet carrying forward a central theme that should be fascinating to the child. It provides suggestive questions and discussion topics that will crystalize the ideas brought out in the text. An admirable school text, it should also be of use in the home. The sale price is one dollar.

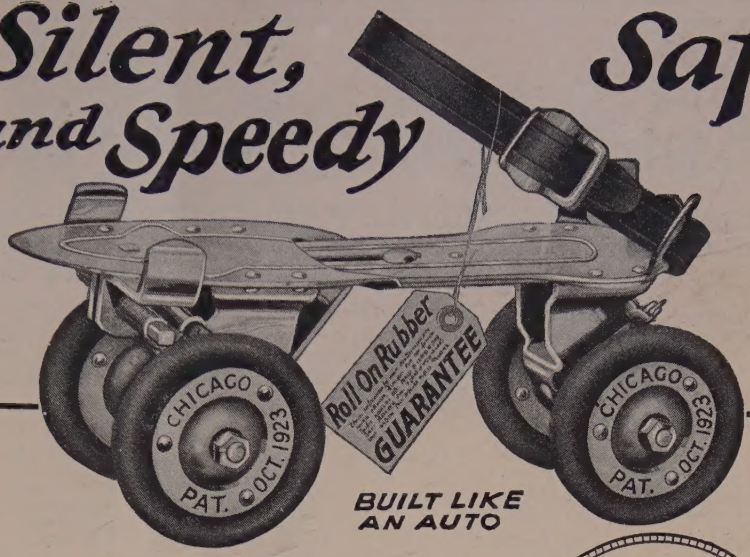
Birds in Rhyme

Fourteen birds, all of them commonly seen, are covered in an interesting little book for the younger children entitled *Birds in Rhyme*. The birds themselves are in color and accompanied by a brief bit of descriptive matter and a short verse for each bird. The volume is gotten up by Julius King and is one of the King Nature Series. The publishers are Thomas Nelson and Sons, New York. The book is attractively conceived and effectively carried out except that the color phase of the printing is not all that it might be. The price is 75 cents.

A Forestry Book

In line with increased interest in forestry, Charles Scribner's Sons have brought out a little book entitled "Our Trees and How They Serve Us," by Rufus S. Maddox, State Forester of Tennessee, and Almon E. Parkins, Professor of Geography, George Peabody College for Teachers.

Silent, and Speedy Safe



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A Nature Puzzle

By FLORENCE MOORE

IF THE object of this puzzle could speak, he would say:

"I am a large, five-toed, proboscidian mammal and a great deal more intelligent than I look. I am not only used by man in certain parts of the world to perform heavy feats of labor, but I provide certain articles for the use of mankind. You may have some of me in your vanity case this minute.

"The letters of my name are in the picture also, so after you have found me, write them down as you locate them, then assemble them to spell my name. Where letters repeat, only one is given. Be sure to find out, too, what a proboscidian mammal is."

Answer to February Puzzle
GO PLANT A TREE

American Nature Association

ORGANIZED TO STIMULATE PUBLIC INTEREST IN EVERY PHASE OF NATURE AND THE OUT-OF-DOORS, AND DEVOTED TO THE PRACTICAL CONSERVATION OF THE GREAT NATURAL RESOURCES OF AMERICA

The American Nature Association seeks to find for Nature Study an essential place in every School and in every American Home. It is working for Forest and Wild Life Protection along sane, economic lines. It believes that clean, healthful Out-of-Door Recreation is the key to Good Citizenship

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March, 1927

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NATURE MAGAZINE

IX MARCH, 1927 No. 3

"God Almightie first Planted a Garden; and indeed it is the Purest of Humane pleasures; it is the Greatest Refreshment to the Spirits of Man, without which Buildings and Palaces are but Grosse Handy-works"
FRANCIS BACON.

THE HOME OF SKY-KING

By BEN EAST

DEEP in the northern wilderness, in a mixed forest of pine and oak, where here and there the bleached bar of a dead spruce thrusts its barren tip up into the summer sky, there stands an ancient oak tree that is taller by many yards than its neighbors. In a high crotch there is a great platform of sticks, some of them as long as an Indian's bow and as thick as a man's wrist, woven together as carefully and firmly as the twigs in the nest of a catbird. The top of the platform is a saucer-like hollow, and in its center is a thick, soft heap of dead grass. So wide and solid is this structure a deer might lie upon it in comfort. It is the aerie of Sky-King, the bald eagle, and his mate.

I almost said "my friend Sky-King," because that is how I have come to regard him since that May day when first I saw him, a regal, white-headed sentinel, perched on his lookout tree, a dead spruce a hundred yards from the oak—voicing in wild, shrill screams his anger at the intruder who had dared to invade the solitude of his wilderness domain.

His mate brooded that day, motionless on the great nest, her head white as the perpetual snow of mountain tops, raised above the edge of the platform; her keen yellow eyes searching constantly the aisles of the forest. That splendid crown of white betrayed her. As far as I could see the nest through the leafless branches of the oak, I could also see the white head of the brooding mother.

Buckling on climbers and safety ropes, I started up. When my head came level with the edge of the platform, two broad shadows crossed and recrossed before me, and the screams of the eagles were constant. That nest was a marvel of construction, woven painstakingly, and of material worthy of a king's home. Great dead branches of oak, spruce and pine, were laced and interlaced till the whole structure lay balanced among the branches as firm as a part of the tree itself. Under the nest the ground was carpeted with a thick tangle of the dead sticks, dropped by the eagles while at work.

I raised my head above the rim of the platform, and the secrets of Sky-King's home were revealed. Three white eggs, nearly round, and a little larger than a duck's egg, were bedded in the heap of soft dry grass in the center of the nest.

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THREE WHITE EGGS IN SOFT, DRY GRASS
The nest was so wide and solid that a deer might have lain in it with comfort.

But three weeks passed before I visited this home again. There were weeks of warm spring days, during which I thought often of the mother eagle, motionless and alert at her tedious but happy task, and of Sky-King, perched on the spruce spar, keeping watchful guard. About them was the unbroken silence of the forest, with few creatures on the ground or in the air that they need fear. I did not blame them that they had resented my intrusion. Royalty has a right to pursue its domestic affairs in solitude if it chooses.

The screams of Sky-King warned me again as I came to pay my second call even before I recognized the landmarks about the place. This time his mate was not brooding. She stood beside the nest, as though she had dropped some task at my approach. I studied Sky-King this time through my glasses, before he decided to leave the dead spruce. At each angry scream, the golden scimitar of his beak parted. He half spread his wings, and threatening rage showed in his every gesture. While I climbed up both eagles hung close above the tree, wheeling and screaming. I came abreast of the nest and raised myself eagerly on my climbers, to look in. The weeks of patient brooding had borne fruit. The three white eggs were transformed into three fuzzy, gray eaglets, that lay sprawled out on the soft lining of the nest, sound asleep.

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THIS WAS SKY-KING'S HOME
It was woven carefully of sticks, some as thick as a man's wrist.

Three babies they were, but of course, not triplets. Like all birds of prey, Sky-King's mate had begun to brood the day her first egg was laid. That egg had been first to hatch, and the eaglet that came forth from it was at least two, and perhaps four or five, days older than the youngest of the brood. The difference was plainly apparent in size and strength as they staggered up at the sound of my movements in the nearby fork of the tree. In one detail, they were alike, the eyes of all three holding the proud, fearless stare of Sky-King's race!

There came, unexpectedly, a soft breath of wind from behind and above me. I looked up to see Sky-King wheeling by, no more than a foot from my face. He did not check his flight, did not scream, nor thrust out his cruel yellow talons in my direction. He only floated by on broad, set wings, as though he would watch closely my dealings with his young. Did I not say he was my friend? Time after time while I stayed there beside his nest, he swooped down through the branches, coming so close each time that I could have reached up and touched him, and yet he made no threatening gesture. When I climbed higher, away from the immediate vicinity of the nest, he and his mate likewise mounted, far above the tree tops and, before I had finished and climbed down from the tree they had perched together in the top of a dead pine two or three hundred yards away, where they watched me with only an occasional warning scream.

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THREE FUZZY, GRAY EAGLETS SPRAWLED
Their partially-finished fish dinner lay nearby partly covered with clusters of pine needles.

Of the truce that was between Sky-King and me, I am sure his eldest son knew nothing. The baby eagle raised himself erect at first sound of me and faced me fearlessly. He was too young to scream, but he opened his

heavy, curved beak, and half spread his clumsy, down-clad wings, exactly as Sky-King had done from his perch on the spruce spar, and greeted me with savage hiss after hiss of anger. He even tottered a few helpless steps toward the edge of the nest nearest me, to drive home the threat.

The youngest of the family, too helpless to stand erect on his faltering legs, watched me steadfastly. The second upraised himself, bracing and balancing with his uncertain outspread wings, and did his best to support the threats of his elder.

Beside them on the far edge of the nest, Sky-King and his mate had established the family pantry and laid in a store of provisions to last for days. There were five big suckers, laid in a neat row, some of them partially covered by the grass in the nest. Of these one had the silvery, shrunken appearance of a fish long dead. The others were fresh-caught fish, that they must have taken themselves by plunging after them into the shallow waters of a nearby lake. One was still wet, and the talon marks along his back oozed fresh blood. Mixed with the suckers was a motley array of smaller fish and some partly-eaten ones that defied identification or count.

Partially covering the store of food were several clusters of green pine needles. What did the eagles want with them? Were they a salad addition to the fish diet? Did the fresh fragrance of the pine tips serve to dilute the odor of decaying fish? Or did this covering of needles serve to aid in preserving the food from decay? I do not know, but, at least, there were no pine needles in the nest when I visited it first. Apparently Sky-King had fed his family a straight diet of fish. There were no bits of fur or feathers in the nest to testify to a meal of any other description.

A month later I paid a third visit to the home of Sky-King. A cold, northeast wind lashed the forest, bearing with it a steady, chill rain. The mother eagle was at home, settled closely on the nest with her back to the storm. Her proud white head was streaked a dirty gray by the rain. Her great wings were half spread to make a broad canopy above the eaglets. The wind whipped through the branches of the oak, turning her drenched feathers up the wrong way, and the cold rain sluiced down upon her through the leaves. If ever a mother bore discomfort with quiet stoicism, for the sake of her young, Sky-King's mate was bearing it. She sat, uncomplaining and motionless for hours, shielding her precious eaglets from the storm that was drenching her.

What of Sky-King himself? Was he hidden away in some dry spot in the forest, where the cold rain did not penetrate, shirking completely his share of the responsibility and discomfort of rearing a family? Sky-King answered presently for himself. He came wheeling in over the forest from the direction of the lake, without warning, like a shadow out of the gray mist of the rain, and alighted on a dead branch above the nest. He clung with one foot. In the other he clasped a limp fish, its tail flapping in the wind. While his mate shielded the young family from the storm, he had gone down to the lake to catch their supper. How he spotted the fish, in the wind and rain-swept water, I do not know. Spot it he had, and his strike must have been swift and sure.

The mother eagle slipped away from the nest at his approach, and soared to their lookout tree. There she perched, a bedraggled figure, robbed entirely of her queenly dignity and beauty, even her white tail stained and sodden with rain. Yet, she was proud motherhood.

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THE YOUNG EAGLES NEARLY READY TO FLY
They snapped and hissed savagely at first but finally settled down to fearless steadfastness.

Sky-King dropped down to the nest, put down his fish, and stood to one side, watching. He did not tear it to bits, or make offer to feed the eaglets. Whether they were big enough to help themselves, or whether he did not yet think it supper time, I could not tell from my post on the ground. He left them after a few minutes and perched near his mate in a dead tree top.

Two days later I went back for a final visit to Sky-King's home, climbing the big oak to the nest again. The eaglets had thrived on their fish diet. I found them big, brown fellows, the eldest well fledged, and nearly ready for flight. They snapped and hissed savagely at me when I first came in sight above the rim of the nest, but before I had finished working they were settled quietly down again on the big platform, watching me with fearless steadfastness, yet without trace of open hostility Perhaps by now they had been made a party to the truce Sky-King had declared with me.

The nest was no longer a well-kept, orderly home. The lining of soft grass was strewn about among the sticks, mixed with the withered, dead clusters of pine needles. No longer was there a supply of food on hand for the next meal. I knew from the strong, curved beaks, and the big yellow feet, armed with long black talons, that Sky-King had not fed them that rainy afternoon because they were big enough to help themselves. They were eating each fish now as fast as it was carried to the nest, and their demands must have put a heavy drain upon the eagles' fishing.

Sky-King's mate circled far above the forest while I worked in her nesting tree, uttering only an occasional scream. I clambered downward finally, and I passed from sight of the young eagles for what I knew was the last time, with a feeling that I was parting forever with three good wilderness friends, to whom I wished the best of luck! I did not see Sky-King. He was away at his fishing. My last sight of him was while he perched in the dead tree top that afternoon in the cold rain.

Before our readers go further with this issue may we call attention to the article in the center of the magazine illustrated in color from plates from the J. Horace McFarland Company.

Chicken Salad

Camera Study by Gregory L. Oliver

PHOTOGRAPH FROM AMERICAN TELEPHONE & TELEGRAPH CO.

THE HEAVY HAND OF WINTER ON THE TREES

A glimpse of the ruin wrought among New England's elms by one of the worst icy visitations of recent years

WHAT PRICE THE ICE STORM?

By Charles Fitzhugh Talman

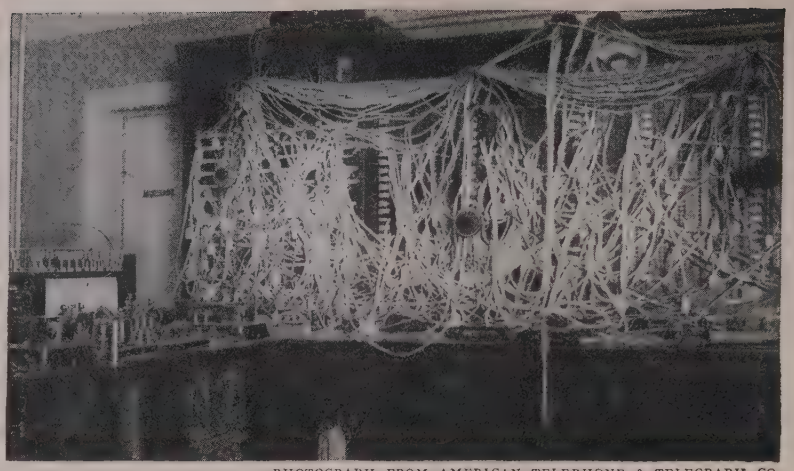
A CITY in flames is a magnificent spectacle. According to garbled history, Nero thought the sight of burning Rome worth what it cost, and proceeded accordingly. An ice storm of the first magnitude is one of the most beautiful shows in the whole repertory of Nature. Unfortunately it is also a first-rate calamity, and its consequences are so expensive that we can hardly maintain the Neronic attitude of mind in regard to it. No modern vandal would be permitted to manufacture a full-grown ice storm for the delight of his eyes—if the feat were possible—though a miniature one was lately staged by the Westinghouse engineers for the entirely commendable purpose of testing the effects of various ice loads on wires, which suffer heavily at such times.

Elsewhere in this issue there is an article that tells of the sap that is running in the trees as spring comes, but the heavy hand of winter has not yet been wholly lifted in our northern climates, and such events as Mr. Talman tells of in this article may still take place

An ice storm is a cold-weather rainstorm, in which the falling water turns to a coating of ice on striking terrestrial objects. The deposit thus formed is smooth and transparent, unless mixed with a previous deposit of snow, and is quite different in appearance from the rough or feathery "rime" often deposited in cold weather by drifting fog, especially in the mountains. The ice formed in the storms we are here describing is called "glaze" by American meteorologists, and "sleet" (a word of many meanings!) by nearly everybody else in the American half of the English-speaking world.

Like the blizzard and the tornado, the ice storm is a spe-

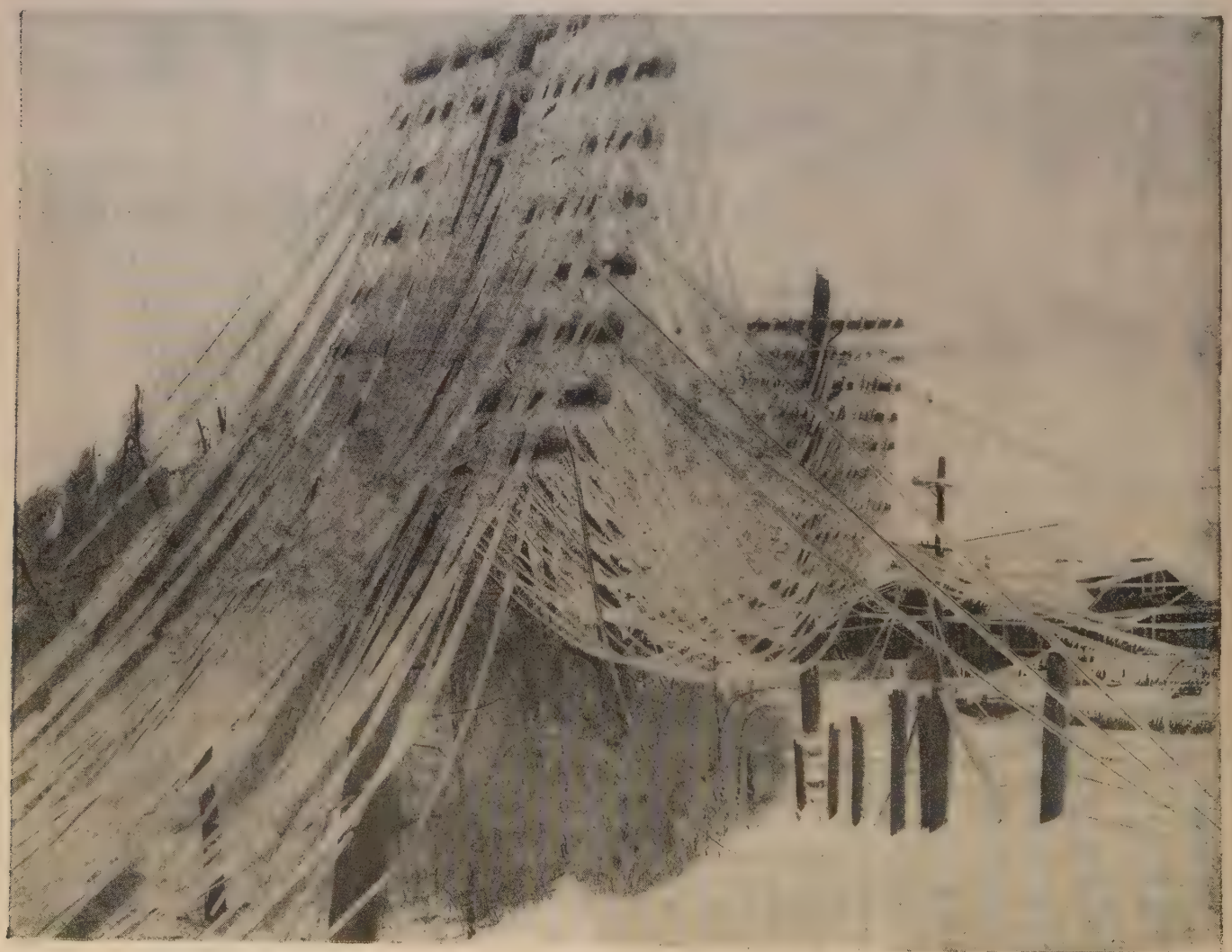
cialty of our American climate. Except in a mild and innocuous form, it is uncommon in continental Europe and almost unknown in the British Isles. In the amount of damage it does in this country it vies with the tornado, though its destruction is less concentrated, and its effects on humanity are troublesome rather than tragic. Its visible havoc is wrought upon the trees and upon the overhead conducting systems of the telephone, telegraph and electric power companies. This consists of breakage under the weight of ice; often fatal in the case of the trees and fraught with far-reaching secondary effects upon the community at large in the case of the broken wires and poles and severed communications.



PHOTOGRAPH FROM AMERICAN TELEPHONE & TELEGRAPH CO.

A TELEPHONE TEST-BOARD AFTER AN ICE STORM
Showing the maze of patching-cords by which the broken circuits are rerouted

In the eastern United States ice storms are episodes in the conflict between moist, mild winds from the Atlantic and the cold, dry winds that sweep outward in winter from the interior of the continent. The colder currents push under the warmer, which are forced upward, cooled by expansion, and thus caused to condense their moisture. This may result in a steady and prolonged fall of rain. If the temperature of the lower air is below the freezing-point, the icy coating formed on wires and branches grows thicker and thicker, until, in a large percentage of cases, the phase of destructive overloading is reached. The amount of damage is greatly increased if high winds set in after the ice is deposited.



PHOTOGRAPH FROM AMERICAN TELEPHONE & TELEGRAPH CO.

FOUR TONS OF ICE TO EACH SPAN
Telephone toll lines near Worcester, Mass., in the 1921 ice storm. Much heavier loads were found elsewhere within the storm area.

New England has acquired a special reputation for these icy visitations, partly, perhaps, because Mark Twain once penned an exuberant description of their magnificence in that region. They are, however, about equally common throughout a broad central belt extending from the Atlantic seaboard to the Upper Mississippi valley. Oklahoma and Kansas have experienced very severe ice storms, and occasionally they invade the heart of the sunny but not always summery South. Georgia and Alabama had a memorable encounter with one of them early in 1923. The Pacific coast is by no means exempt. The copious precipitation on the western slopes of the Sierras and the Cascades not infreqeuntly takes the form of an ice coating.

An ice storm made history in New England in February, 1898. The formation of ice was so astonishing on that occasion that a plaster cast was taken of one of the ice-encased wires of the New England Telephone and Telegraph Company, and is now exhibited in the Bell Historical Museum, in New York. The wire, with its coating of ice, weighed 3.2 pounds to the linear foot.

In its general effects this storm was, however, eclipsed by the one of November 27-29, 1921. The area affected in this case amounted to about 3,600 square miles, with the focus of destruction in east-central Massachusetts. North of this area there was a heavy fall of snow, while to the southward rain fell without freezing. The ice storm was accompanied by fairly high winds, and the rain continued steadily for more than seventy hours. Ice began forming on Sunday, the 27th. By the following morning it had reached the danger point, and for two days its ravages grew more and more spectacular.

Great limbs were torn from thousands of trees and crashed to the ground. In the woods the fall of the ice-laden branches and the collapse of heavy boughs was so incessant that the mingled sounds had the effect of a continuous roar. More than 100,000 trees were wrecked beyond recovery by this storm, and it is said that a century from now the effects of the catastrophe upon the woodlands of New England will be plainly discernible to the critical observer of tree habits. Streets became impassable and dangerous. Four or five persons were killed and several injured by falling branches, poles, signs and roofs. Schools were closed, electric lights were extinguished, and the life of the community, deprived of telephone, telegraph and trolley-car service, slowed down almost to a standstill.

Every householder who has dealings with the iceman knows that frozen water is heavy stuff. It weighs about fifty-six pounds to the cubic foot. Several determinations were made of the weight of ice accumulated on branches

PHOTOGRAPH FROM AMERICAN TELEPHONE & TELEGRAPH CO.

MILES OF FALLEN POLES
A typical scene along a New England road in the great ice storm of November 26-29, 1921.

and wires in the New England storm. The weight of a branch was increased in some cases more than thirty-fold by its ice coating. It was estimated that a tree fifty feet high and of an average width of twenty feet carried a load of five tons of ice. In one case an iron guy wire, with its sheath of ice, was found to weigh six pounds to the foot.

PHOTOGRAPH U. S. WEATHER BUREAU

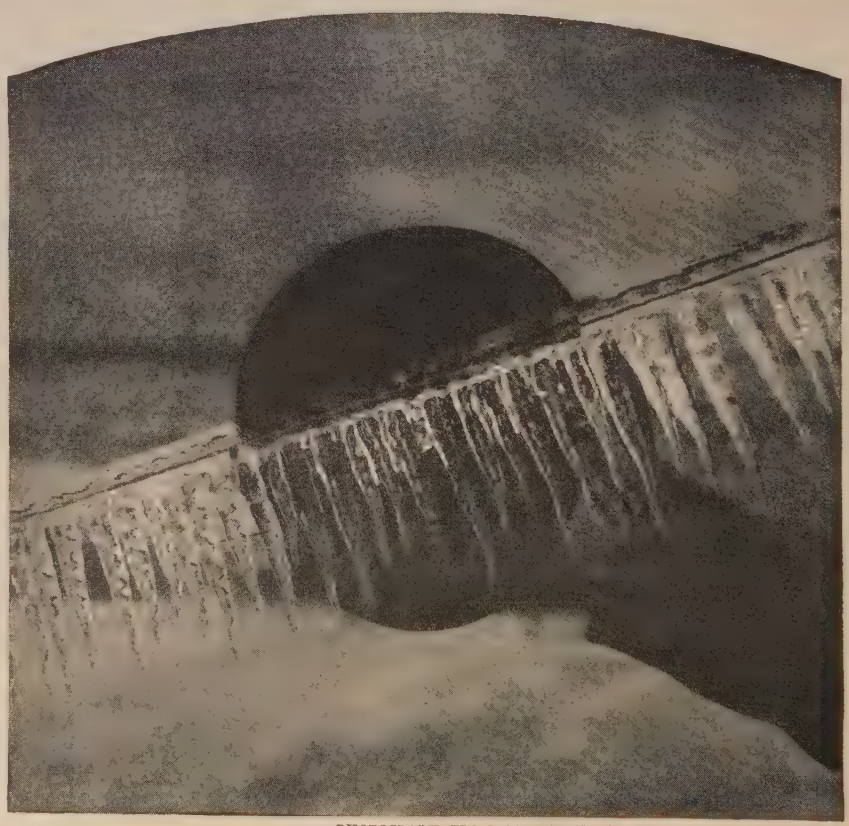
A MODERN VERSION OF THE ICE AGE
A garden near Portland, Oregon, buried under tons of "glaze," [November, 1921.

Just west of Worcester, where the poles carrying the New York, Springfield and Pittsfield telephone toll lines have eight cross-arms with ten wires to an arm, the average weight of the ice-clad wires was one pound to the foot. As the distance between poles averaged 110 feet, this means that each span carried a burden of 8,800 pounds, or more than four tons. A pole may be sturdy enough to carry such a weight as long as the strain is equal on both sides. It often happens, however, in an ice storm that a span of wires is broken by falling trees or branches. The result is to release the tension on the side of a pole next to the break, and under the unbalanced pull on the opposite side the pole snaps off like a pipestem; whereupon all the poles for a stretch of a mile or more may go down in rapid succession within the space of a few minutes. This was a common occurrence in the New England storm.

Among the public utilities affected by an ice storm the telephone industry is usually the chief sufferer, on account of its enormous mileage of overhead wires. The underground cable between Boston and New York mitigated the effects of the storm just described, so far as the public outside the storm area was concerned, but within that area telephone service was, for the time being, "shot to pieces." The companies, as usual, rose to the occasion and performed miracles in restoring the broken links of communication. Within the first ten days following the storm more than 100,000,000 feet of wire had been laid on the ground or attached to fences and tree stumps. Upwards of 3,000 men were employed in clearing up the wreckage, setting new poles, running wires and connecting telephones. The total cost of this disaster to the telephone, telegraph and electric lighting companies was estimated at five million dollars.

Two other ice storms of the last few years may be cited as illustrating how heavy a toll these recurrent events levy upon the nation's pocketbook.

The storm that prevailed in parts of eastern Minnesota and generally over central Wisconsin and Michigan February 21-23, 1922, did great mischief to overhead wire systems, but it was especially noteworthy for the enormous havoc it wrought in woods and orchards. A forester who inspected the scene of this calamity tells us that the devastation was "on the scale of that caused by great fires and tornadoes." Hundreds of thousands of fruit trees were destroyed and many fine orchards were almost wiped out of existence.



PHOTOGRAPH FROM AMERICAN TELEPHONE & TELEGRAPH CO.

DOUBLY LOADED WITH ICE
The coating of this wire was 2 inches in diameter and some of the icicles were 9 inches long. Compare size of hat.

The storm of December, 1924, stands out in the history of the public utility com-

panies as the greatest of all such disasters in its effect on their properties. Beginning a week before Christmas, it covered within the next few days a belt roughly 150 miles wide extending all the way from Texas to the Great Lakes. In the three states of Texas, Oklahoma and Missouri the ice tore down 34,000 poles and put more than 25,000 miles of open telephone wire out of service. In Illinois the Western Union Telegraph Company lost 8,000 poles and the Illinois Bell Telephone Company 23,000. The region around St. Louis suffered the maximum effects of this storm. Trains were forced to stop running because there were no signals to guide them and the tracks were littered with ice-covered debris. More than 5,000 passengers were stranded in the St. Louis Union Station for forty-eight hours.

The telephone companies had an especially serious problem on their hands in this case, because the storm-stricken belt lay straight across the transcontinental system of communications, which was, momentarily, severed by the disaster. Telephonically, coast was cut off from coast as completely as in the days when the highways of speech had not yet scaled the Rockies. The night-and-day struggle that the repairmen waged with that inundation of ice through weeks of bitterly cold weather is still referred to by telephone men as "the Great Ice Battle of 1924-25."

The public little realizes the arduous tasks that are performed on such occasions—by the linemen in the field—by the men who solve Chinese puzzles at the testboards in rerouting the broken circuits—by the clerical employees, both men and women, who lend a hand wherever needed.

The wire-using industries are accustomed to these battles with ice and have developed standardized methods and a highly mobile organization of their repair forces for coping with each situation as it arises. The Bell System and its associated companies maintain thirty-one large supply warehouses in different parts of the country, from which materials for repairing damages can be shipped promptly into a storm area. A fleet of motor trucks is available to supplement crippled railroads. The cost of these affrays, which mounts up into the millions each winter, is met from a special reserve fund, accumulated through the year and charged monthly to operating expenses.

The ruin of wires and poles by clinging ice is a relatively novel form of calamity, since the property affected is a development of modern industry. With the progress of invention such damage will be diminished and perhaps eliminated. Already radio and underground cables provide channels of communication that are invulnerable to the assaults of ice. Electric power companies know how to melt ice from their wires by sending heating currents through them. The electric railways remove ice from trolley wires by means of a special type of trolley wheel provided with a cutting edge. One railway keeps its "third rail" free by spraying it with a solution of calcium chloride.

The plight of the trees is—alas!—perennial and apparently incurable. They are at the mercy of the elements.

A Western Currant

By Frances S. Twining

ONE of the most attractive of the wild shrubs of the Pacific Coast is the *Ribes glutinosum* or incense shrub, commonly known as Indian currant. In the south it comes into bloom in the early winter but north of California its blossoms are one of the lovely evidences that Spring is really come.

This wild currant grows from six to more than twelve feet high and is common in valleys and canyons, along roadsides and at the broken edge of mountain forests. It gets the name *Ribes* from the ancient Arabic, and *glutinosum* suggests the stickiness characteristic of the leaf when the plant first leaves out. These leaves are prettily scalloped and the whole growth is graceful, especially the drooping blossoms, borne in clusters of seven and more. The flowers vary from pale pink to deep rose and are in long gay clusters, bearing the very spirit of Spring in their fragrant, waving blooms. The green is gay, too, in its new freshness. This shrub transplants readily and lends itself to combinations with other wild shrubs, particularly with hazel, service berry and cedar.

PHOTO H. P. CRAMER

THE FLOWERING CURRANT
It is host to the rufous humming bird who seems to have agreement with it.

Not only is this Indian currant appreciated for its own beauty and fragrance but there is another association which adds much to its popularity, especially if one is a bird-lover. And the fruit is also attractive, blue berries with a heavy "bloom". The rufous humming bird, a cousin of the ruby-throat of the East, seems to have a secret understanding with the Indian currant. When it is in blossom, if we watch and listen, there comes our expected hummer. He flies straight, from out the very skies, it seems, to the waving branches of rosy blossoms. From one bunch of pink racemes to another he travels, sipping eagerly. He seems almost as glad to be there as the watchers are to have him, and we greet the Spring together,—we and the pink currant.

WHAT OF CUMBERLAND FALLS?

IF there is one important task before the American people to-day it is the movement to assure for posterity the preservation of land and water areas of scenic and recreational value. Through the National Park Service this is being accomplished on a national scale. States, counties and communities have a like opportunity and duty in instances where the areas cannot logically be included in the National Park class.

Such an area, to an outstanding extent, is Cumberland Falls, Kentucky, with a beauty that none who has seen it will forget and with an average yearly flow equal to one-third of the flow over the American side of Niagara. There is pending, however, before the Federal Power Commission, a petition from the Kentucky Hydro-Electric Power Company for permission to dam the river one mile above the falls, back the water for miles behind and drain it down to a power house a mile below the Falls.

THE FALLS AT FULL FLOW

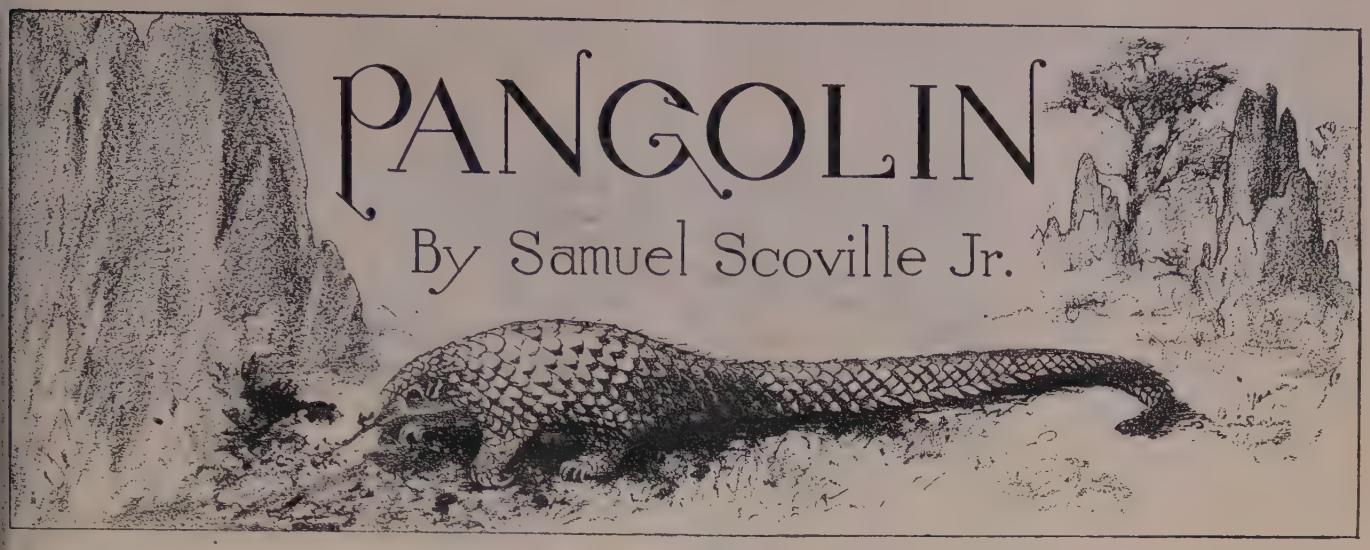
Below the falls are shown at low flow, but their beauty remains and is worth saving.

In the January issue of *Nature Magazine,* in a brief note, members of the American Nature Association were urged to write to the Federal Power Commission urging the preservation of Cumberland Falls. This request was made at the instance of the National Conference on State Parks, whose chairman is Judge John Barton Payne, and whose vice-chairman is the Hon. Stephen Mather, Director of the National Park Service. In at least one instance a member received a reply from Mr. O. C. Merrill, executive secretary of the Federal Commission, defending the development, but admitting that none of the three members of the Commission—the Secretaries of War, Interior and Agriculture—had, to his knowledge, seen the falls.

Mr. Merrill supports the project, so far as the flow of water is concerned, on the ground that the permit, if granted, would prescribe a regulated and continuous flow over the Falls. This is a plausible argument, but in the light of experiences with other power developments it is a provision difficult of enforcement and infrequently lived up to by the permitees. Artificial control of Natural phenomena rarely works.

Mr. Merrill's other grounds for defense are that five to six million dollars would be spent in the development, giving labor to the citizens of the county, creating taxable property and thus benefiting a section now existing under conditions of extreme poverty. Except for unskilled day labor that can be locally employed, most of the workers would have to be imported, probably at least seventy-five per cent. On completion a small force, also skilled, would be needed.

In view of further inquiry into the matter and in the light of the fact that an alternative site—the Wolf Creek Site, considered feasible by many engineers—the American Nature Association feels that it again can urge its members to address the three members of the Commission requesting that Cumberland Falls be preserved. Additional information, proscribed by the demands of space, will be sent to members on request.



PANGOLIN

By Samuel Scoville Jr.

THE far-away mountains which ringed the plain showed a shadowed lavender in the star-shine. There the moon hid during the day and smote with madness any man rash enough to visit her haunts,—so the elders of the Masai said.

Slowly the eastern sky became a mass of daffodil-gold and the peaks of the distant range were crested with burning rose. A tree-dassie, that little rodent who is a second cousin to the rhinoceros, greeted the dawn by croaking like a frog and crying like a child.

Then, sudden as the opening of a furnace door, the gold blazed into crimson flame, the smoky red disc of the sun wheeled up the sky and another day had begun on the veldt.

Down the wind with the dawn came the strange notes of a hunting pack of wild dogs. "Hoo-hoo, hoo-hoo," they bayed as they galloped across the sun-scorched plain, a score of tawny figures large as mastiffs, their white bushy tails stretched out behind them. Running so close that a tarpaulin would have covered them all, they drew blank covert after covert of stunted acacia trees and mimosa scrub, bristling with six-inch thorns. As they approached each thicket some of the fastest of the pack would separate themselves from the others and take their station along the expected line of the run. No human hunters could have taken into consideration better the wind, the nature of the ground and the habits of the game they sought.

One of the recent additions to the varied tenantry of the National Zoological Park in Washington is a Pangolin. Mr. Scoville, in his vivid style, tells here a story of this animal and its struggle for life on its native veldt.

The sun was well up in the sky when they roused a black wildebeest, that strange animal with the head and horns of an ox, the body and tail of a horse and feet and legs of an antelope. With a bellowing snort, the gnu, as the Hottentot hunters have named the animal, leaped high into the air and giving a couple of sprawling buck-jumps, started across the plain in a straight line. The wild dogs settled down for a long hunt since, in spite of his clumsy appearance, the wildebeest is one of the swiftest and most enduring of the great antelope family to which he belongs.

Mile after mile the fierce hunters followed him as he ran in a clumsy bounding gallop which yet ate up the distance like fire. At intervals as if to show his contempt for his pursuers, he would leap high in the air, whisking his white tail sportively as he jumped.

At the end of the first hour the gnu began a long circle which would at last bring him back into the boundaries of his own range, for no animal, however fiercely hunted, will go far into new and unexplored country.

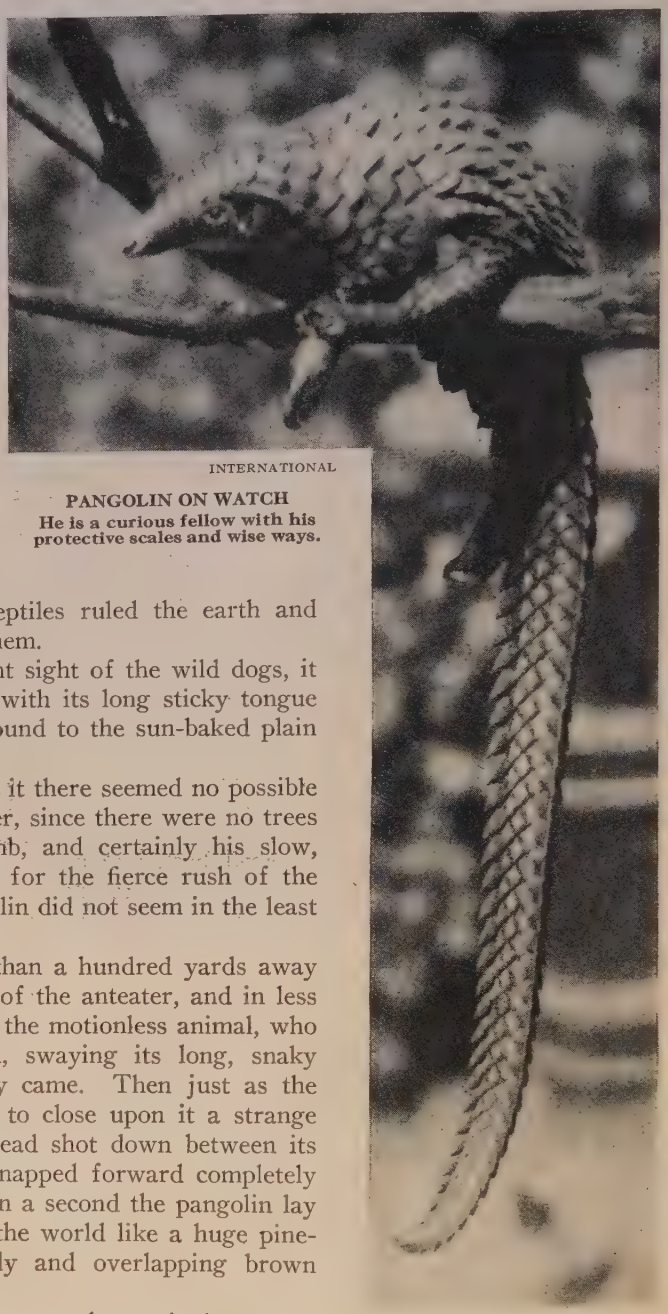
The pace set by the wildebeest had been too swift for the weaker members of the pack. One by one the younger dogs began to drop back until only the most seasoned hunters held on and could not be shaken off even when the fugitive increased a speed which already seemed incredible.

Then, as the gnu passed a line of wooded mounds, suddenly from behind them three fresh dogs, which had dropped back and ambushed themselves at this point, dashed out and took up the running, while the rearmost of the pack cut across a segment of the vast circle which their instinct told them the hunted wildebeest would make, and stationed themselves where they could rest and act as the relay in this race which the gnu was running with death. Slowly but inevitably the tactics of the wild dogs wore down the endurance of the wildebeest, until, after an eight-hour run, the black bull went to bay with his back to a thicket bristling with thorns.

With his sharp out-curving horns and hoofs which cut like knives, the old gnu fought for his life and although his umber-brown hide showed here and there red gashes where the slashing teeth of the charging pack had got home, yet several of the dogs limped and tottered as they moved. The end came when the crafty leader of the pack crept like a snake through the thicket and with lightning-like snaps of his fanged jaws cut the tendons of both of the bull's hind legs. Once down, the hungry hunters made short work of the disabled animal and in a very few minutes had stripped every fragment of meat from his long bones.

The rapacious pack started once more across the veldt seeking what they might devour. As they came near one of the round mounds raised by the termites or white ants, the foremost dogs of the pack caught sight of one of the strangest of all the strange animals of the veldt.

It was some six feet in length and looked more like a lizard than a mammal for it was covered with overlapping horny scales which protected every inch of its body from the tip of its toothless muzzle to the end of its broad, flat tail. Its eyes glittered like crumbs of black glass and were set on either side of a pointed, snake-like head, while the bowed and powerful forelegs of the creature were armed with trowel-like claws. White men have named this scaly anteater "Pangolin," but those black hunters, the Bechuanas, call it "Khaaka," which means "the beast which never was," and which is a good name, for the pangolin is one of the most impossible, incredible of animals, a left-over from another age when reptiles ruled the earth and even mammals looked like them.



INTERNATIONAL

PANGOLIN ON WATCH
He is a curious fellow with his protective scales and wise ways.

As the strange beast caught sight of the wild dogs, it stopped lapping up termites with its long sticky tongue and sidled down from its mound to the sun-baked plain below.

As the pack rushed toward it there seemed no possible way of escape for the anteater, since there were no trees nearby which he might climb, and certainly his slow, crawling gait was no match for the fierce rush of the hunting pack. Yet the pangolin did not seem in the least disturbed.

The dogs were not more than a hundred yards away when they first caught sight of the anteater, and in less than nine seconds were upon the motionless animal, who had watched their approach, swaying its long, snaky head back and forth as they came. Then just as the dogs' open jaws were about to close upon it a strange thing happened. The odd head shot down between its forepaws, the armored tail snapped forward completely covering its underparts and in a second the pangolin lay on the plain looking for all the world like a huge pine-cone with its rolled-up body and overlapping brown scales.

The pack threw themselves upon the motionless mass, and rolling it over and over worried it in vain. Not even their powerful teeth could penetrate the scaled armor which protected the anteater's life. Finally as the fierce hunters drew back, baffled by the pangolin's defense, the flat, clamped tail relaxed slightly, two sets of tremendous curved claws were thrust out and before the astonished eyes of the pack the pangolin began to sink out of sight, digging himself in under his armored mantel.

Again the furious dogs threw themselves upon the disappearing figure, but were able to make no more impression upon it than before, and in another moment the curved back of the anteater was level with the ground, and when the pack began to worry it they only got their mouths full of red earth for their pains.

As the scaled anteater disappeared the dogs dug desperately after it but in vain. A pangolin is as much at home beneath the surface of the ground as a fish below the surface of the sea, and that one never stopped digging until a good three feet under ground.

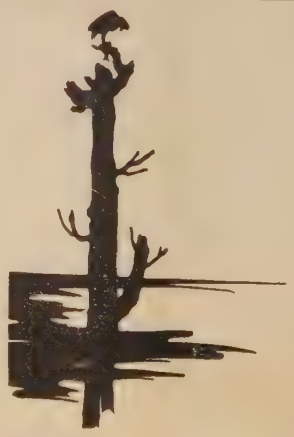
Then it rapidly tunneled zigzag passages from one side to the other, each one sloping deeper until even the keen noses of the hunting dogs could no longer determine in what direction it was going.

Once more, as in the days of the wise king, the race had not been to the swift nor the victory to the strong.

April is the month of nesting time and Paul Griswold Howes will have an article in that issue on the house-hunting season of the birds.

In the third article on the American Nature Association's Expedition to the Bering Sea, William L. Finley will take the readers to the fascinating Pribilofs.

A. B. Champlain contributes an important little story that gives the excellent advice, "Tackle the Tussock Moth".



Marjorie Shanafelt will be represented in April by another delightful story in the Children's Department, and Elizabeth K. Peeples will contribute her second story for the Nursery Nature Tales. We would appreciate the reactions of our members on these two departments.

These are only a few of the fascinating features in the April issue, which will include two pages of color painting by R. Bruce Horsfall.

MIMUS THE MATCHLESS

By Herbert Ravenel Sass

ONE memorable morning there came to my garden a bird of mystery which carried—or, at least, so I believed—a marvelous secret in its tail. In eastern North America there are two birds of the cuckoo family, the yellow-billed and the black-billed cuckoo. The former is very abundant in the region where I live and is a common summer inhabitant of my garden; the latter is very rare in all this region and had never been recorded within the garden's bounds. These two cuckoos are very similar. They are of about the same size and shape and almost of the same color, except that in the black-billed cuckoo the whole bill is black, while in the yellow-billed species the lower mandible is yellow with a black tip. The best way to distinguish one from the other is to examine the under surfaces of their tails. In the yellow-billed cuckoo the outer tail-feathers are broadly tipped with white, while in the black-billed cuckoo these white tail-markings are narrow and inconspicuous.

Now when this bird of mystery came, he did not seem at first glance to be a mystery at all. He seemed, when I first looked at him, to be nothing more exciting than a yellow-billed cuckoo or "rain crow," as the species is commonly called. But suddenly I was aware that this cuckoo's lower mandible was not yellow, or at least did not appear yellow as I viewed it from the ground under the tall pecan tree in which the bird was perching.

Instantly, then, my hopes soared skyward. To the bird-watcher in a garden few things are more exciting than the discovery of some new species, some species never before recorded there; and if this species happens to be not only unknown in the garden but also very rare in all the surrounding country, the bird-watcher's excitement becomes a frenzy of delight. When I saw, or thought I saw, that the lower mandible of this bird in the tree above me was black instead of yellow, all other human concerns were forgotten in my burning desire to get a good view of the bird's tail.

The tail would settle the question. If the tail-feathers were *broadly* tipped with white, the bird was only a yellow-billed cuckoo and was nothing to marvel over. If those tail-feathers were *narrowly* tipped with white, then the bird was, beyond all doubt, a black-billed cuckoo, and another red-letter day would be added to the garden's red-letter days. In the tail lay the secret. At that height I could not be sure about the color of the lower mandible. Amid the deceptive lights and shadows of the twinkling leaves I could not with certainty distinguish those slight differences of color tone which, at closer range and in a better light, might have served to identify the bird. In order to make sure, I must see that tail; and instantly the seeing of that tail became almost a matter of life and death. You bird lovers will know.

With this fascinating story of Mimus, the mockingbird, we are delighted to welcome Herbert Ravenel Sass to the pages of Nature Magazine. Our members have doubtless encountered elsewhere his fine writings of Nature, but we feel sure that they will find added delight in this story. Mr. Sass stands in the front rank of our contemporary naturalist-writers, and in order to locate the scene of this story of Mimus, we should mention that his home is in Charleston, South Carolina, and his work largely is done there.

It is often difficult to get a good view of a cuckoo's tail. Indeed, it is often no easy matter to get any sort of view of a cuckoo, for both the cuckoos are wary, rather ghost-like birds, keeping generally to the thick coverts and decidedly averse to inspection of human eyes. So it proved that morning. This cuckoo had all the secretiveness of his secretive tribe. From tree to tree in the garden he led me a merry chase, without once giving me a good look at him; and at last he hid himself with utterly fiendish ingenuity high in the tallest elm, the leafage of which was particularly dense because to the tree's own leaves was added the luxuriant foliage of a huge wistaria vine.

There I searched for him for many minutes without finding him; but at last persistence had its reward. I not only found him where he perched, silent, motionless, eerie as an owl, in a little open space amid the green; I also found his tail. That is to say, for the first time since the chase began that tail was plainly visible and was in such a position that with the aid of field glasses I could readily determine the size of the white feather-tips. In another moment I should have had the secret.

In that moment came *Mimus polyglottos,* the mockingbird, prince of song, paragon of grace. The field glasses had been raised half way to my eyes, my lips had almost framed those magic words "Black-billed cuckoo," when Mimus the Matchless, Mimus the Meddlesome, hurled himself into the picture.

A half-second he hovered on quivering wings just above the cuckoo, his slim legs dangling, his long bill open as he sounded a rasping challenge; and in the next half-second, the cuckoo—that bird of mystery which carried, I still believe, a gorgeous secret in its tail—was gone before I could learn the secret.

And this time he had gone for good, for Mimus the Meddlesome gave him no chance to hide himself again. One more halt he did make in another tree near by; but Mimus was upon him like a flash and compelled him to take flight once more. Vowing vengeance upon all mockingbirds, I watched him flee far from the garden with the Meddlesome One still in hot pursuit.

This grievous and sorrowful episode serves well to illustrate one phase of the mockingbird's character. It is only one of many similar incidents in which the mocker's combative spirit has inspired thoughts of murder. Over and over again he has interfered at just the wrong moment—at just the moment when some interesting newcomer to the garden, vaguely glimpsed among the branches, was about to show his colors and make known his name. Mimus has undoubtedly cost me some worthwhile discoveries, for some, at least, of those newcomers whom he has smitten hip and thigh

before I could get a good look at them would have revealed themselves as rarities. But while I cannot help counting this against him, after all it does not weigh very heavily in the scales, and those sanguinary inclinations which he sometimes evokes fade quickly away. For, when all is said, Mimus the mockingbird is a marvel and a blessing, a bird in a thousand, a wonder-working magician of the feathered world.

Much has been said and written about his song. It has been compared, not always to the mockingbird's advantage, with that of the wood thrush, of the hermit thrush, and of the veery—singers who, as Bradford Torrey puts it, "reach the soul." But those who contend that only in respect to technique is the mockingbird supreme and that his greatest merit is the marvelous vocal skill which enables him to reproduce the songs of many other birds, do him much less than justice.

Listen to him in the "sweetness of the high-fastidious night" as he sings under the moon. Perhaps his night song is no finer than that which he sings by day; but he has the magic of moonlight or of starlight to help him then, so that it is in the still, silvery night, fragrant with honeysuckle or jessamine or wild rose, that he achieves his finest effects and most powerfully moves his listeners. All the rapture of all the lovers that ever loved is in that song; and it seems to me that there is in it also all that is comely and joyful in Nature, all that is bright and virgin in the green-living world.

Perhaps this is too extravagant a fancy; yet so infinitely varied is his song that one thinks of the slim gray bird as Nature's chosen interpreter, her universal bard to whom it is given to know and express in music all her beauty and wonder. Do you remember the song of the flute in Sidney Lanier's poem, "The Symphony"? I think—although the poet does not tell us so—that Lanier's flute is a mockingbird singing in the April moonlight.

"A HALF SECOND HE HOVERED ON QUIVERING WINGS, JUST ABOVE THE CUCKOO."

I wish that I could quote here all those beautiful lines of Lanier which, although the poet apparently did not have the mockingbird in mind when he wrote them, always recall to me

"That cheerful one that knoweth all
The songs of all the winged choristers,
And in one sequence of melodious sound
Pours all their music."

And I wish, too, that I could describe that other quality of the mockingbird which, next to his melodiousness, is the most charming thing about him—his gracefulness. I should like to picture in words that dance of the mockingbird's which is half dance, half make-believe battle, a dance which is one of the most graceful things in Nature. But while the habits of the mockingbird are well known, the mockingbird himself has never yet been described by any one and, I think, never will be described because he is one of those miracles of Nature which defy description. I cannot conceive of any magic of words which would enable one who had never heard it to imagine the mocker's song; and his gracefulness, too, is a thing which neither the writer's pen nor the artists's pencil can express.

Something may be said, however, about the mockingbird's personality and character. About his everyday habits nothing need be said because these are set forth in many books. He is pre-eminently a bird of personality, one of the most

distinctive and most attractive personalities in the whole feathered world. He is always, no matter what the season or the surroundings (I am not speaking now of caged birds, each one of which is, to my mind, a tragedy), vividly, exuberantly alive. Brimfull of the ecstasy of life, for him existence is wholly a joyous thing and the world a glad place; and I think that ninety-nine out of every hundred moments of his life are happy moments, and that he is almost never afraid.

We have heard much of the tragedy of "Nature, red in tooth and claw," of the ceaseless struggle for existence among the wild things; of the overshadowing, ever-present fear which, so we are told, is an inevitable part of their lives. Spend an hour with a mockingbird and that grim and ugly conception of the animate world will be discarded forever. Doubtless he, too, has to struggle for existence; doubtless he, too, is often in danger of death and has his part in Nature's unending war. But you will learn very quickly how lightly this danger weighs upon him, more lightly than the lightest feather; and you will learn very quickly that the philosophers who do their philosophizing indoors are far astray when they tell us that all Nature is a vast charnel house and that Nature's wild children dwell always under the dark shadow of fear.

"LISTEN TO HIM... AS HE SINGS UNDER THE MOON"

It is perhaps because his personality is what it is that the mockingbird's character may be said to fall somewhat short of perfection. One exuberantly in love with living finds it somewhat difficult to live the life of a saint, and the mocker in his everyday behaviour does not attain to perfect saintliness. Life holds out to him various little temptations which he cannot resist, chiefly the temptation to interfere unduly in the affairs of other birds, as in the case of the mysterious cuckoo to which I have alluded. When one has admitted, however, that the mocker is a meddler and, in a limited sense, a bully, one has said about all that can be said against him, and certainly these are not very serious flaws of character. Moreover, "bully" is, I think, too hard a word, for it generally carries the implication of cowardice, and the mocker is no coward. On the contrary, he is one of the most courageous of all the smaller feathered folk and is more than a match for any other bird of his own size, with the exception of the loggerhead shrike, whose strong hooked bill gives him a decisive advantage.

On the score of intelligence the mockingbird undoubtedly ranks high. He has not the craftiness of the blue-jay or the fish crow; but his mind is even quicker, I believe, than that of either the catbird or the brown thrasher, his close relatives and birds of exceptional intelligence. The fact that he has a good brain in his head ought to be of some value to him in the solution of his life problems. He is undoubtedly one of the most successful of all American birds. No other has done better than he in maintaining his place in the sun despite the encroachments of man.

It is probable, I think, that mockingbirds are more abundant today than they were before the white man came, for Mimus has accepted civilization as a blessing and has become man's friend and neighbor. In the region which is properly his home, he is among the most abundant of all birds in city gardens and parks, in villages and in the immediate neighborhood of farm houses. You will find him very seldom in the depths of the woods or in wild places remote from human habitations. He dwells with man and rejoices in man's presence; yet why he should thus seek human companionship is something of a puzzle, for he lives mainly upon insects and various sorts of berries and does not depend for a livelihood upon the seeds which man plants in his gardens and fields.

All this morning a mockingbird has been singing in the elm outside my door. He is only one of many mockingbirds that are singing all over town. It is mid-February, and the winter has been colder than usual, with more than the normal number of gray days; but, for some reason beyond human comprehension, the mockers have sung this winter as I have never known them sing be-

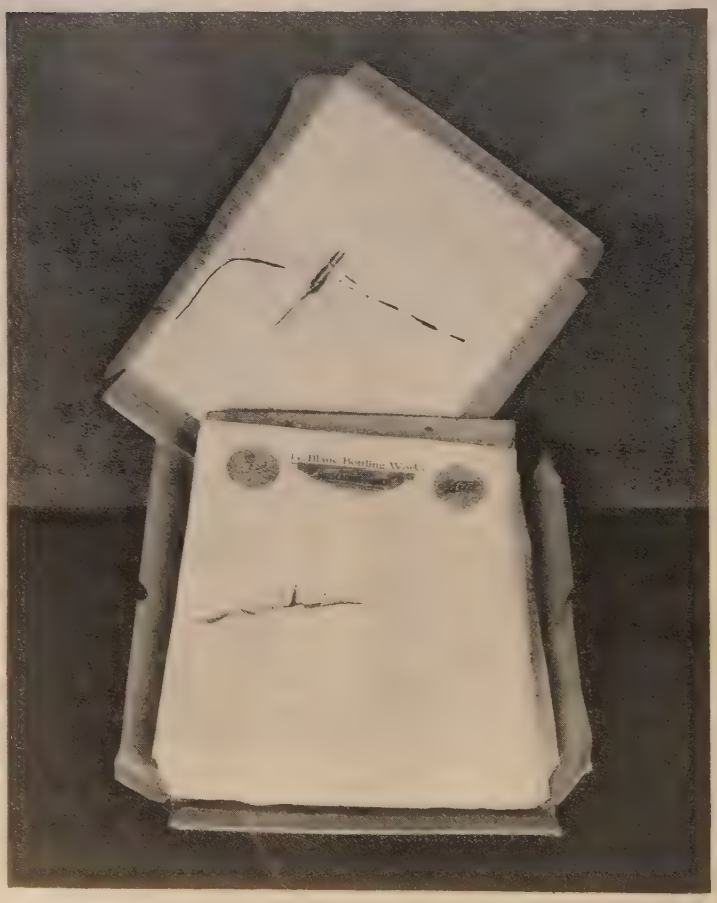
fore. Their fall singing season, which as a rule begins in early October and lasts until late November, has this year continued straight through the winter with only brief intermissions during severe cold waves; and now for a month or more they have been singing as continuously and as joyously as though spring were at hand.

Why should they have chosen this gray, chilly winter for this exceptional carnival of song? I cannot guess; but the fact is, I think, characteristic of the mocker; indicative of his personality. He is no flesh and blood machine, no animated automaton strictly subservient to rules and laws. He has a mind of his own, a distinct and strongly marked individuality. Up to a certain point he is, of course, like all birds and all living things, a creature of routine; but more often than most other birds he will depart from the rules laid down for him and will go his own way regardless of the principles and regulations which the ornithologists have prescribed in their books.

That is one reason why it is a joy to live with him and to study him. Never in all the days of your life will you learn about him all that there is to learn. Never will you know him through and through. He will have something new to show you up to the very last; when you have studied him for years, he will spring some fresh surprise.

He is a fellow of whims and fancies, a bird of infinite variety. Better than their bright plumage, better than their melodiousness, we love the etherial lightness and airiness of birds, those fairy-like children of the air who are seemingly as buoyant as the air itself. In the mockingbird, more than in any other bird that I know, this physical quality and grace becomes a quality of the spirit; of the personality as well as the body.

"What's Eating Our Letter Paper?"



RECENTLY there arrived at the offices of the American Nature Association a box of business letter paper, every sheet of which was blank but which told an interesting story. Under separate cover there came a letter from the LeBlanc Bottling Works of Covington, Louisiana, asking the answer to the mystery of the little white "grubs" that had constructed for themselves an intricate system of passages in the boxed letter paper. They had tunneled through one whole box, which had been at the bottom of a pile, and, given time, would have gone on upward.

There was no mystery, of course, because this was the work of termites, or white ants, insect pests that cause hundreds of thousands of dollars of damage to buildings throughout the eastern United States, the Central West and the Pacific Coast. The paper was sent to Dr. Thomas E. Snyder of the United States Bureau of Entomology, whose life appears to be dedicated to fooling the termites and who knows almost their very thoughts. A photograph of the letter paper is reproduced here.

"Insulation," Dr. Snyder emphasizes, is the answer to the problem of checking termite damage. No untreated wood should be placed on or near the ground in building construction. Better, it should be set in concrete at least an inch thick around the wood. Through the educational activity of the Bureau of Entomology and cooperating organizations, revision of building codes that will thwart the termites and save much property is being urged and gradually accomplished. Suggestive codes and directions for combating the termites can be obtained from the Bureau of Entomology of the Department of Agriculture in Washington, D. C., on request. The small home owner and prospective home builder, as well as the large builder will find that it will be "money in his pocket" to be forewarned.

CAMERA HUNTING IN THE NORTHLAND

By William L. Finley

The second article in the story of the American Nature Association Expedition to the treeless islands of the Bering Sea.

PHOTOS BY FINLEYS

BUFFY JOINED THE PARTY
Mr. Finley, with the sea gull pet, and two views of the bird that "went civilized."

Chapter III—The Shadow of Shishaldin

"WELL, we haven't a steam shovel and we can't pile any more sand out here, so I quess we had better quit."

Now some seven feet under ground and about thirty feet from where we started, that burrow still sloped toward China. It was like a question mark; we had hopefully set to work at the period and were now perspiringly almost back to it again. It all had come about because Cuffy had sniffed so persistently at the mouth of a fox den in the sand. As clearly as a black bear could, Cuffy had said, "There are some small live cubs down there somewhere, and I want them to play with." What fun it would be, we thought, to add to the expedition's menagerie a couple of baby red foxes, for red foxes we knew them to be, as we had frequently seen on the dunes and tundras of Unimak Island those swift red shadows which were now near and now gone. The Captain of the *Westward* labored almost out of sight in the excavation. It was he who passed some remark about digging down to China, but I hastily advised him that China was not on the other side of the world from Alaska, and more likely he would come out somewhere in South Africa.

It was evident that the Captain preferred navigating to excavating; and, as I was also completely worn out from my share in the digging, there seemed nothing else to do but give up the venture.

"Those baby bears can surely smell farther than we can dig," sighed the relieved man with the shovel. "By the way, where are those little cusses, anyhow? Haven't seen 'em around here in a long time."

Even as he spoke, there appeared across the tundra a bounding, gamboling, bellowing thing, and into camp dashed Cuffy, searching his innermost soul for sounds to tell us how scared he was. It was hardly conceivable that one small bear could produce such a tremendous disturbance. Tuffy was not at his heels. Where was Tuffy? Something must be wrong, and we organized a relief party forthwith. We ranged the tundra for a mile all around, but no Tuffy. We swept the horizon with field glasses, but still no Tuffy. All this time Tuffy's playmate gave vent to those heart-rending yells, and refused to be comforted. Had one of those foxes stolen up like a shadow behind the baby bear and jerked him down into the depths of the earth? A grown fox might have been strong enough to do so, had he pounced upon the cub unawares, but there was no sign.

"Perhaps," said one of the party, "some big bad-tempered brown bear came along and batted Tuffy into the middle of next week, just as a method of self-expression." If so, there wasn't even a smear to remind us where Tuffy had landed.

Even as we stood discussing what might have happened, a possible answer came from the sky. It was the hoarse scream of one of the two eagles which had been circling around all day. The other eagle had gone; his mate was apparently following him with all haste. Was

that the true answer? We never knew, but several weeks later, when I climbed to the eyrie of a great bald-headed eagle's family, we found in the nest the hind quarters of a caribou calf. The eagle which had carried off this booty might well have managed a ten-pound baby bear. Cuffy alone knew the real tragedy, and he could not tell.

That night, as Cuffy lay close to us about the camp fire on the tundra, seeking human companionship in exchange for that of the wild brother he had lost, Mount Shishaldin in all its volcanic beauty looked down upon us. Snow-mantled, the graceful sloping sides shone coolly through the twilight night, and now and then a glow, as from some far distant blast furnace, burst through a cleft near the peak. Shishaldin was warm at heart where the lava churned within. Cuffy's heart was empty and lonely.

As I sat gazing at the great volcanic peak, something in its cold beauty and fierce inexorable ruggedness awoke within me that desire which every mountain climber knows. In that feeling there was both a call and a threat, but somehow the threat made the call seem stronger than ever.

We decided to travel by water along the shore, and then up the river toward the base of Shishaldin. Campbell, the Captain, and the engineer, took the motor canoe; and the rest of us fitted in between the piles of equipment in the rowboat and light Old Town canoe. A strong pull on the starting cord and the motor began to pop. The tow lines snapped taut and our procession of little boats leaped forward through the waves. By the time we reached the mouth of the river, the old Bering Sea looked decidedly woolly, and the wind had risen. Suddenly a cross current caught us. Quick as a flash the Captain, in the motorboat, lunged to cast off the tow ropes.

"Every boat for itself!" he yelled; but he was a moment too late. We had a glimpse of a great wave breaking over the bow of the motor canoe. Another one seemed to slap in from the side. There was a scurrying of men, a splashing of spray.

When we could see clearly again it was to view an upturned hull with three men some distance away in the water. The next roller caught them and swept them still farther from the upturned bottom. They tried their best to regain the boat, and one of them seemed to do so. The others were caught in a rip of the tide and

"WOOF," SAID CUFFY (Right)
The sea lion pup, however, made no evident reply to these advances.

PHOTOGRAPH BY THE FINLEYS

MURRES CAME AND WENT (Below)
They loosened rock and shale that showered down on their comrades.

PHOTOGRAPH ROWE DYKEMAN

swept ever farther down the coast. What could we do? In our overloaded boats we were powerless. We must make for the shore, unload one of them, and then rush back as fast as we were able to the rescue. It seemed hours before we got the light canoe headed outward again through the surf, and Campbell and the engineer managed to catch hold of the sides of our craft. It was impossible to draw them in. The Captain was still clinging to the hull, and, although nearly exhausted, managed to hang on until we got back to him.

Meanwhile, those in the rowboat had also managed to make a safe landing on the shore through the surf. Wet through themselves, they fully realized that warmth alone would save the lives of our rescued, but half-frozen, comrades; and they had built a huge fire of driftwood for the purpose. An hour later, as we sat steaming and smoking about the welcome blaze, I looked up for the first time to see Shishaldin again towering over those tiny human beings clustered in its shadow. A mighty symbol of inexorable Nature, the mountain rose, unmindful alike of the tragedy of yesterday and the nearly triple tragedy of to-day.

PHOTOGRAPH BY THE FINLEYS

A VIEW OF NEW BOGOSLOF
It looked as though a giant had built it of huge blocks of granite.

The wind now shifted toward the north, and it behooved us to get out to the *Westward* soon or not at all, abandoning all idea of further acquaintance with Shishaldin from this angle. Even by the time we had broken camp, the breakers were pounding in and we had to wade into the surf like members of a lifeboat crew to get off at all. Cuffy had had enough of waves, even though he was not one of those actually shipwrecked on the previous day. The moment the first roller hit him he streaked off down the shoreline with Cam after him. In-

PHOTOGRAPH BY THE FINLEYS

INVESTIGATING THE POSSIBLE NEW PLAYMATE
Shorn by an unkind fate of his buddy, Cuffy, the bear cub considers the sea lion pup as a companion.

PHOTOGRAPH BY THE FINLEYS

A PEAK OF OLD BOGOSLOF
The island held a continuous threat of volcanic action and erupted soon after the expedition left.

stead of the orthodox pursuit of a man by a bear, here was a case in the reverse. Cam did two hundred yards in record time and reclaimed our remaining cub, so all of us finally arrived on the *Westward,* wet through and ready for hot baths and warm food to revive us. Using the heavy dory, we collected the stranded boats of the day before, and then headed west, cruising along the north shore of Unimak and dropping anchor that night in Dublin Bay.

Snow-covered Pogromni Volcano glittered in the sun the next morning as we passed by it on our way to the end of Unimak Island. Passing lonely Sarachef Lighthouse, we crossed Unimak Pass to Akun Head and sighted Akutan Island; then, soon after, the village of Akutan. Across the bay from the village was the headquarters of the North Pacific Sea Products Company, a whaling station.

Having dropped anchor here for a bit, the next morning Campbell, Cam, and I shipped one of the outboard motors on the rowboat and set out down the bay to explore some interesting-looking cliffs with bird inhabitants. The strong tide defeated every attempt to reach an island where many birds were nesting, so we landed in a little cove where a pair of Aleutian song sparrows sent a beautiful carol of welcome echoing along the cliffs. While we were watching these fellows, larger and with fluffier and warmer plumage than the song sparrows of the States, the tide whisked our boat away. It was headed for the passage and a long, lonely trip somewhere in the Bering Sea. For us its loss meant a hike of several miles over mountains. Off came all but my woolen underwear, and I finally retrieved the boat. The tide got only one of my socks in exchange. A drift

PHOTOGRAPH BY THE FINLEYS

BULL SEA LIONS WERE FEROCIOUS
They resented the intrusion of the expedition into the serenity of their harem.

PHOTOGRAPH BY THE FINLEYS

MOTHER SEA LION NURSES HER PUP
These strange mammals of the sea scarcely set flipper on land save for the purpose of breeding.

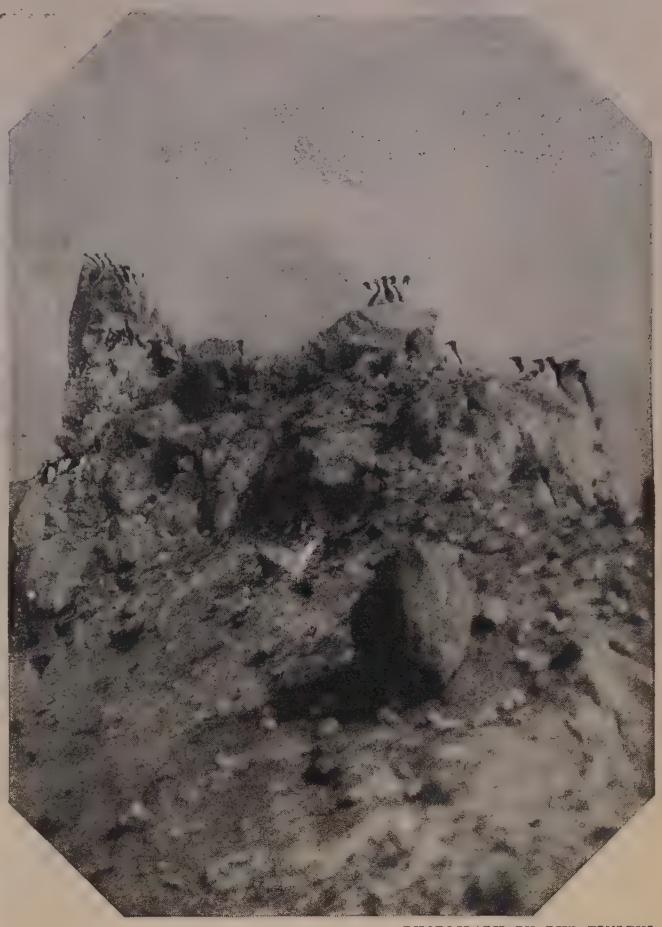
fire was burning to thaw me out, and a climb up the mountain finished the job.

From the top of the mountain, impressive itself in its ruggedness, we looked down on Akutan Bay and out over the Pacific Ocean. Willow ptarmigans and titlarks we found on the summit and not far below several leucostictes or rosy finches were busily flying about. Snow still hung in sheltered nooks, and great cliffs broke off hundreds of feet to the water's edge. The sun set over a scene of noble isolation and indescribable grandeur.

Nearby we found an island literally covered with glaucous-winged gulls. The nests of these sea rovers held two or three eggs, gray or brown and spotted dark brown. A pair of black oyster catchers flew

anxiously about as we photographed a couple of their youngsters. The older birds were a little smaller than a tame pigeon, black and with long red beaks. Then there was a quiet inlet off Udagak Strait. Its green flower-covered slopes stretched up and up until they touched patches of snow; a stream meandered down to the bay from a lake two miles inland. Cam took Cuffy ashore, where he had a field-day digging roots and racing his small legs into fatigue. If Cuffy missed his late playmate, he now showed no sign, for Nature quickly heals the wounds of the soul. Two whalers joined us in the hospitable inlet for the night and the next day we spent dogging their wake in fruitless search of whales, returning to Volcan Cove again for the night.

A day's trip brought us to Dutch Harbor on the Island of Unalaska, a village of note in the gold-rush days when boats sought its shelter to await the break-up of the Bering Sea ice. The village of Unalaska, headquarters of the Coast Guard Service and the Alaska Commercial Company, has now outstripped Dutch Harbor as a business center.



PHOTOGRAPH BY THE FINLEYS

PALLAS MURRES NESTED ON BOGOSLOF

The high, crumbling pinnacles were like beehives, so massed with the bird colonies were they.

Chapter IV—Bogoslof Island

The two rugged volcanic mounds that are Bogoslof Island greeted us the following afternoon. To the south was the part known as Old Bogoslof, two jagged peaks rising several hundred feet from the shore line. A mile to the north is another high rock, flat on top and called New Bogoslof because it appeared after the eruption of 1883. A long flat table-land shelves off to the north from the old island, breaking off into a region of hot sand, pitted with steam-spouting fumeroles. A wide flat, whose floor is of cinders, burnt rock, and sand, and whose one edge is a hot lagoon, extends on to New Bogoslof.

Bogoslof has "acted up" on several occasions, the first offense known to man being in 1796. It has "come to life" since, in 1906 showering the town of Unalaska with ash and cinders. Three years later it again trembled and the next year new peaks with two summits appeared in the center of the island. It was because of these visible upheavals that we suspected hidden reefs and took careful soundings as we cruised around the island to the west. A line of sandy beach whitened as the waters of the Bering lapped it. Glaucous-winged gulls circled the boats inquisitively. Squadrons of Pallas murres winged past, homeward bound from fishing grounds. About our hull the water was sulphur-colored, breaking sharply into blue where the waters of the bay joined the ocean. Along the shore line, warm currents ran.

New Bogoslof, looking as though some giant had built it of huge blocks of granite, was host to vast colonies of Pallas murres. To and from their nests in every conceivable cranny which the cliffs of the table-land afforded, these birds flew, loosening rocks and shale to the dire

PHOTOGRAPH BY IRENE FINLEY

BOGOSLOF STEAMED IN MANY PLACES

Cuffy investigated a few hot holes and quit, but the rest of the party explored.

danger of their fellows below. Puffins had homes in the crumbling cliffs, and to the north nested Kittiwake gulls and cormorants.

Both of the high, crumbling pinnacles of Old Bogoslof were like beehives, so massed were they with murre colonies. The beautiful seal-brown backs of these birds and their snow-white breasts made a striking picture as each sat erect on its own home site, guarding its lone egg. A wise Nature made these eggs pear-shaped after the manner of the weighted salt shaker that will not upset, thus staying their fall from the nests.

PHOTOGRAPH BY THE FINLEYS

PALLAS MURRES AND THEIR EGGS
In the foreground are the eggs, which, vari-colored, were scattered like a garden of tints.

The murres are squatters, not home-builders. They ask no more than standing room, building no nests, but seeming unerringly to find their rightful eggs, which, vari-colored and different, look like a rock-strewn garden of tints.

"Is that driftwood on the shore?" called Cam, as we approached the shore line of Bogoslof. Our question was answered when one of the "logs" reared its head to bellow and roll over—a sure-enough bull sea lion basking in the sun. These mammals of the sea hardly set flipper on land save to breed. In the spring the bulls, big fellows weighing half a ton, come to the breeding place to select a site for their respective harems. This spot the bull guards viciously and with his life, jealous of his harem of cows and his litter of twenty to twenty-five-pound "pups."

We anchored in a quiet little bay and during most of the night the creatures kept up an intermittent roaring. The next morning Cuffy led the party ashore. Eagerly he started his explorations, but ground that was considerably hotter than good ground should be, sapped his enthusiasm. He poked his nose into one strange-smelling hole, and then, with a wild yelp, announced that he had had enough of volcanoes. As between constantly tilting decks or red-hot holes, he for one preferred the former, and suited his action to the thought. Cam caught him, a flurry of ungainly legs and yelps, only at the very edge of the surf. After some persuasion, Cuffy consented to follow carefully in Cam's footsteps, but he was certainly a much subdued bear cub.

Shorn of his twin by an unkind fate, Cuffy next investigated the possibility of a sea lion pup as a playmate. As we approached, the cows took to the water, leaving their offspring scattered about. Several business-like bulls warned us off, but Cuffy found a lone pup snoozing by himself and stepped up to talk things over.

"Woof," said Cuffy. "I never saw a bear cub like you." The sea lion pup raised his head and looked with shining, curious eyes, but made no evident reply.

"Woof," repeated Cuffy. "What do you want to go humping along like that for? Why don't you walk like a self-respecting bear?" and like a suspicious policeman Cuffy sniffed inquiringly of this strange creature's breath.

"Mind your own business," snarled the young sea lion, and he opened a threatening mouth so suddenly that Cuffy leaped back in dismay. It was plain to our little mascot that this rude beast was no proper companion for a well brought-up bear, and he retreated somewhat stiffly. Perhaps it was just in time, for an indignant father with a very wicked-looking expression came humping and bounding up the beach. The bull's temper was not of the best, for he had been alternately charging the Captain and Mrs. Finley for the last ten minutes, not being in the least pleased at posing for a movie close-up. Cuffy remembered that he had pressing business elsewhere.

But if Cuffy did not care for a sea lion as a playmate, we at least added a new member to the *Westward's* zoo. Over beyond a shattered lava ridge in gull-land a bullying party was in progress. One speckled ungainly mite was being most cruelly picked on by an elder brother. Small Betty Church sped to the rescue and returned presently with the baby gull fearfully cuddling in her cupped hands. "This," she announced, "is Buffy, and he's going to sail with us." Of course, that settled it. Thereafter Buffy lived luxuriously on table scraps, his daily meal lasting from daylight to dark. A salt-water bird, he developed and indulged a strange taste for fresh water, and became a constant source of wonder to the gulls that flew about the ship, circling to get a closer view of one of their own kind "gone civilized."

We went on to explore the mysteries of Bogoslof, which gave us an impression of an ancient and romantic past. It was bereft of anything green, inhospitable and yet host to varied animal life. It held a continuous threat of action. We stayed two nights in the little bay, hoping that something would happen, but it didn't. Two weeks after we had gone Bogoslof set to changing its topography again. When we heard of the new eruption we thought of those millions of eggs and murrelets, those marvelous rookeries of life, and wondered. Were they all destroyed? Time would not then permit us to return to Bogoslof, and I do not know.

Nursery Nature Tales

BEING THE ADVENTURES of TOBY & BETH
TWO VERY LITTLE PEOPLE IN THE BIG WORLD

Better Than Airplanes

By Elizabeth K. Peeples

TOBY and Beth had fed their canary. Toby put bird seed in his cup, and Beth laid a lettuce leaf on his floor. They had given him fresh water, too.

"He has a yellow dress," said Beth, "but it isn't like mine."

"Could he fly far if we opened his door?" asked Toby.

"Open it and see," said Mother. Toby's brown eyes sparkled. He opened wide the cage door, but the canary did not come out.

"You will have to come away from the cage, Toby mine. Perhaps if you and Beth and I talk about something else he will come."

"You tell a story!" cried Toby climbing into Mother's lap. "Yes, let's talk a story," agreed Beth, cuddling down at her knee.

"Have you ever thought," began Mother, "about the many, many little birds that live outdoors. They have no gilt cage. Nobody feeds them, nor gives them water."

"But they can take care of themselves, and that's better, isn't it?" asked Toby.

"Yes, Toby mine, I think it is," Mother answered. "Do you know why your canary needs your care? It is because he and his parents and grandparents and great grandparents have lived in cages so long that they have grown helpless. Look, he's coming out."

"Oh Toby, don't you wish you could fly?"

"When I'm a man I'm going to fly—in an airplane. I'll fly farther and faster than birds. Won't I, Mother?"

Mother's arms held him very close. "Unless airplanes are made better than they are today, you will not fly so well as some birds do, Toby mine," she said.

"I saw our robin today. He was over by the cherry tree. Where has he been all winter?" asked Beth.

"On his vacation far away, little Beth. You have not seen many birds outdoors since the first snow came, but now there will be more and more of them daily. They have no airships nor automobiles to carry them, but they have wonderful engines, just the same, for taking long trips. A bird's engine is his wings. Automobiles wear out with hard use. So do bird's wings. When they need repairs the old worn feathers drop out, and new grow."

"But my canary's feathers are his yellow dress," objected Beth.

"You're right, dear," Mother answered, "so changing feathers gives the birds new traveling

dresses. The father birds usually wear brighter suits when they come back to their old homes in the spring than when they leave in the fall. And besides traveling suits, there must be lunch on long trips.

"The birds carry food along but not in a lunch box. They store it up, as fat.

"When Daddy drives the auto he follows the road. Birds follow roads in the air. We cannot see these roads, but somehow the birds know just where they are, and use them year after year. They sometimes meet with accidents on their long journeys just as people do.

"But most of them come safely home," added Mother, patting Beth's dark curls, "to do the most interesting thing in the world. Watch your robin and see what that is."

"Look, look," cried Toby, "the canary has gone back in his cage. He is tired already. Is that because he doesn't use his wings often?"

HINTS and HELPS for HOME and GARDEN
March

DO YOUR goldfish look unhappy? Have they frayed fins and do their dorsal fins droop disconsolately? Put them in salt water for a few days, being careful that the water is of the same temperature as that from which the fish were removed. A suitable proportion is an ounce of kitchen salt (two heaping teaspoonfuls) to a gallon of water. As this water grows stale it should be changed every day or two and be replaced by fresh salt water.

Do not hang your canary in direct sunlight all day long. It is not good for his health or for the quality of his song.

If the canary is puffed up and if he scratches himself frequently, it is a sign that he is entertaining unwelcome guests. Put a dry white cloth around his cage at night, being sure to have several creases and folds in its arrangement, and when it is removed in the morning you will probably find tiny red insects which have crept from the bird, along the perch and into the folds during the night. Burn the cloth or soak it in boiling water.

Now is the time for housecleaning. Prepare your bird houses for their new occupants. It is always well to attract birds to the garden as most of them will cooperate with you in your war on garden pests.

Are your garden tools overhauled and in readiness? You won't have time to bother with them later on.

Do not throw away the bulbs which have bloomed in the house during the winter. Dry them out and store them in dry sand until fall, and then transplant them outdoors among the shrubbery to give a naturalized effect. They will not bloom well for a year or two but will then repay you amply for your trouble.

Sow the seeds of Jerusalem Cherry and Pepper Plant in shallow boxes and transplant them in small pots when about an inch high. Plant them out in the garden in pots when well started, and they will be ready to fruit in time for Christmas.

If you have no yard or garden, lay your plans to sow annuals in a box garden and enjoy your flowers in spite of city surroundings.

This is a good month for sowing a new lawn and repairing the old one. Spread manure while the ground is still frozen to prevent cart tracks from disfiguring the lawn.

Loosen the litter which has been spread on your flower beds during the winter. This will allow the air to circulate. But prevent danger from a late frost by leaving the litter on the beds a few weeks longer.

New strawberry plants do best if set out in the spring as early as the ground can be worked. Pick off the blossoms and do not let them bear fruit the first year. In this way you will get a bigger and better crop later on. Rich well-rotted manure worked into the soil produces excellent results and humus holds the moisture of the soil to ensure juicy fruits.

You can have raspberries in your own back yard. Buy rooted slips and plant them in the spring. The second year prune them before they start growing and be sure to remove weak shoots as well as dead ones.

Apple trees which have been severely girdled by mice during the winter can often be saved by bridge-grafting around the scarred area. This should be done after the tree has started to come alive and the bark peels readily but before the new growth has begun.

Prune the clematis and other climbing vines. Prune the hardy roses but do not prune the climbers as their blooms come from last year's growth. Wait to prune them until they are through blooming.

Give the asparagus bed a good dressing of salt. It will help to keep down the weeds and will do no harm to the plant as the roots are far below the surface.

Give the cherries and apple trees a final close examination for the egg masses of tent caterpillars. The small dark oval masses can readily be discovered now.

GARDEN NATURE

"Are the readers of NATURE MAGAZINE *interested in mere cultivated flowers?" the editor was asked.*

Is there a relationship between the naturalist explorer undergoing hardships and privation in quest of zoological or botanical specimens and the modern home dweller digging in his garden? In the accompanying article the author tells us some interesting and significant facts.

By
ARTHUR NEWTON PACK

THE cruising boat of a scientific expedition in British Columbia swept around a bend in the channel and members of the party crowded forward with mingled exclamations of surprise and curiosity. The port of Simoon Sound lay directly ahead—a cluster of shanties built on rafts moored close to a rocky precipice. Tier on tier rose mountains, bristling with the green spires of giant firs and cedars. They reflected again in the still water and mingled above and below with clouds and sky. But none of these beauties called forth the buzz of excited comment taking place on the deck of the expedition's boat. "Flower gardens! Well, who would ever expect roses and climbing nasturtiums on a raft! Look at those sweet-peas—fourteen feet high or I'm a poor guesser." Thus shouted men who supposed that all such manifestations had been left hundreds of miles and days of travel behind.

Nature means to some of us "the great open spaces" where men are men, animals are grizzly-bears, and women and flowers are both wild. If we cannot go to those places in fact, we make contact through books, magazines, and our own imaginations. But this is not the true and complete interpretation. There is a parable about a mythical giant—a strong man of the Samson type. So long as he had his feet on the soil of Mother Earth he could perform muscular miracles, but the moment he lost that touch with Nature he was like Samson after the hair-cut—his strength was gone. This is a good parable because it partly explains why those of us who cannot live in touch with the real wild feel the urge to plant a garden. Then, don't forget that the leading citizens of that bunch of shanties called Simoon Sound, right in the heart of the wild, were not content with merely looking at Nature. They, too, insisted on having a garden and practising with Nature themselves. That is what gardening is—not just seeing, but doing. That is why gardening becomes a hobby with men, women and children.

PHOTOGRAPH H. ARMSTRONG ROBERTS

TWO KINDS OF GARDEN FLOWERS

Men with practical natures plant beans and potatoes. The yield is the result, the taste the reward. Flowers are miracles which Nature performs in the realm of beauty, to please the eye, and—if the poets know whereof they speak—to feed the soul also.

Gardening brings Nature to the home. Successful gardening is Nature Study, for good luck comes to the gardener who understands what the plants need and why. In the smallest garden bed goes on the struggle of all life—the battle for the survival of the fittest, the selection of the

CENTAUREA

strongest. The gardener cannot change Nature, but he says, "I will make Nature develop thus and so." He obtains his result by removing the enemies of the particular living things he desires to cherish. The methods which the gardener pursues are the fundamental beginnings of scientific research. The principles which he discovers for combatting destructive agents are the very principles underlying forest and wild life protection. Thus the planting and tending of a garden is the expression of the Nature Instinct found in varying degrees in every human being. We can carry it as far as we like, we can stop at any stage of expression, as the limitations our time and our own natures may demand.

PRIMROSE OR PRIMULA

ICELAND POPPIES

The instinct to become a naturalist or investigator is a phase in the development of every child between the ages of four and fourteen. It may last longer or recur later. School gardening is an effective means of utilizing this

CANTERBURY BELLS

instinct in the interests of primary education. The life history of the bean or the narcissus bulb is the most perfect and simple object lesson in the ways of Nature.

DIANTHUS PINKS

But gardening for children is more than this—it is a practical method of general Nature Study suitable to

AQUILEGIA OR COLUMBINE

urban conditions, where trips afield and direct contact with forests and wild life are too difficult.

For fathers and mothers gardening is a true and

COREOPSIS

healthful form of play or recreation. It is creative, not merely in the sense of the creation of new flowers such as advanced gardeners attempt, but in the sense of artistic development. The great pleasure and satisfaction derived from growing flowers lies in the study of location, mass and color effects. Heavy spires of Foxglove, Phlox, and other tall stiff perennials are best offset with border groupings of lower delicate blossoms. A single beautiful plant of Aquilegia or Columbine may be lost

THALICTRUM

against the riotous splash of Peonies in full bloom. Dianthus or hardy pinks, no matter how free from weeds, seem disappointing if overtopped with showy oriental poppies, yet the pink blossoms come into their own when picked and placed in a small vase by themselves. A rose bush seldom has a place in a bed of other flowers. It will not only bloom better, but look better in a bed by itself or with other roses.

If someone could write a garden book so complete that the gardener could make no mistakes, more than half the fun of gardening would be lost. Besides, no one would read the book except the poor devil who had to read the proof. The joy of gardening for the amateur lies in saying, "Next year I will move these plants together and scatter those—next year I will have the best garden yet." The most beautiful gardens you have ever seen, gardens of great country estates where paid gardeners tend the plants, bring comparatively little pleasure to their owners. If the owner of a garden feels that his garden is perfect he will not be a gardener long.

Dallas Lore Sharp once wrote an essay on seed catalogs. The modern seed catalog is itself a thing of wonder and beauty; but, oh, the marvels that it promises; oh, the dreams of appetite and art that it inspires. It would be a mistake, however, to hold forth the catalog season as more than the veriest *hors d'œuvre* preceding the banquet. It may be that claims and hopes will be later shattered before the onslaught of disappointment, weeds and worms. It may be that realization, like roast beef, will obliterate the taste of imaginary stuffed pheasant, but prove none the less substantial and satisfying.

GARDENING BRINGS NATURE TO THE HOME

The second course of the garden banquet is epitomized in the arrival of the seeds and their actual planting. How smooth and neat are the straight rows or carefully raked beds! Be sure, however, to examine the seeds themselves. Here are hard round peas, wrinkled and unpromising; here is a handful of brown dust soon to become succulent spinach. But the flower seeds offer still further variation. Could you tell any of them apart without the envelopes? Delphiniums and columbines will look very different later on, but see how alike their seeds appear. If you had these flowers last year, you know how similar are their ripe brown seed pods and even the arrangement of the seeds inside. Then, here are some curious long seeds like bits of cotton lint. They do not really look like seeds at all, but they will become gaillardias or coreopsis or some similar flowers which form no true pod, merely loosening their petals to turn the central mass into a factory of winged aviators.

Snapdragons again have tiny round seeds so small that it is difficult to sow them properly, and the gardener will have to do a lot of thinning or transplanting.

Iris and dahlias both produce seed, although the amateur gardener generally buys the rapidly multiplying tubers or roots for quicker results. The growing of iris from seed is a proposition which requires time, experience and care. Amateur dahlia growing, however, is becoming more popular every year, particularly as beautiful blooms may be had the same year from seeds sown in the early spring. In the northeastern sections of our country, however, it is advisable to plant the dahlia seeds in a flat box of soil in the house as early as February, transplanting them later to the garden after all danger of frost is over. In Dahlia growing the amateur also has the opportunity of easily fertilizing the blossoms artificially and thus being sure what cross he is making.

Let no mere man despise gardening as women's work and child's play. It is a game played with Nature in which men like the late Luther Burbank and Frederick Law Olmstead have attained the highest professional rank. A rockery of wild flowers and ferns, a border of English Primroses, a shady corner made to bloom—every garden offers a multitude of possible plans, a long line of obstacles to conquer, and a never-ending source of pleasure. A garden is a bit of Nature itself, pliable to our hands, restful to our minds, and symbolical of Life itself.

This Month's Story

THE WANDERER

By Marjorie Shanafelt

For the Children

"I DO wish there was some place else to swim than just up and down this same old muddy creek," scolded a cross little muskrat one fine morning. He had paddled from his front door to his back door at least twenty times and the front door looked so much like the back door that he really couldn't tell which was which any more. Now he was feeling decidedly cross. He grabbed a bit of floating grass and with this in his mouth went sailing on down the creek. Since there wasn't any muskrat out of the water save his nose and stiff whiskers and these entirely concealed by the grass in his mouth, he could float for hours without anyone noticing him. The water swept soothingly along his silky sides. The little muskrat paddled moodily on. Once in a while he climbed out of the water on the shelving bank of the creek, his feet and heavy tail making funny patterns in the mud. "Same old thing," he grumbled and slipped back into the creek. So he went on down and down.

HE SCARED A WHOLE OFFICE INTO HYSTERICS
But he was really nothing but a very timid little muskrat yearning for his home.

He had just about decided to turn back towards his front and back doors when he felt an added ripple along his sleek brown sides. A big round thing was spilling a lot of water into the creek. The little muskrat looked at it a long time, before he climbed out on the bank and made his way around until he could stick his head up and catch some of the spray on his whiskers. "My" thought the little muskrat, "what a wonderful creek this water must come from," and he scrambled on top of the pipe. He hung over the edge and looked in. Suddenly his feet slipped and he found himself on the inside of the pipe, but very near the edge. His first concern was to keep in the pipe and not be pushed out by the flow of water so he kicked out with his hind legs and worked so hard that at last he was far enough in to stop and consider matters.

"It is just like this," the little muskrat said to himself, "here I am not far from a nice new creek and if I don't go and find it now, it might dry up or something." So the little muskrat paddled on and on. "It's a long way to that other creek," he sighed several times. After awhile he got so tired he decided to turn back, but when he tried to do so he found he couldn't make the turn, and after trying again and again he grew frightened and hurried on. The water wasn't quite so deep. The pipe grew smaller and smaller, in fact, if his hair had turned forward instead of backward he would have stuck tight. His whiskers were trembling violently from excitement and fear.

Suddenly the pipe ended and the little muskrat tumbled out into a cement basin. Overhead to be sure was a very small pipe that went straight up the side of a building although the little muskrat had never seen one and didn't know what it was. Around the corner of the building snorted a noisy automobile and the poor little muskrat ran as fast as his feet would carry him, blindly, just hunting safety. There was an open door and through it went the muskrat. The automobile began to unload a big wooden box and the little muskrat had never heard such a noise in all his life. He hurried his tail around a corner and as fast as his weak legs would carry him he ran down a corridor and turned into another open space.

"Oh," screamed a high voice, "look at that dreadful rat!" There was flurry of skirts and a rattling of heels as girls climbed to the tops of stools and desks. There were hurried commands from deep, manly voices. "Watch out" the voices cried, and "Don't let him get you!" whereas the poor little muskrat was too frightened to get anybody.

"Why did I leave my back and front doors," he murmured with trembling lip, but everybody thought he was getting ready to bite them and screamed in greater fear than ever. He would have run away again but he couldn't see any place to run to. Never had he seen such an odd place. The floor was not a bit like the soft oozy creek banks, but hard, and it hurt the soft little balls of his feet. His whiskers trembled as he tried to sense the humps on either side where people kept papers and ink pots and on each of which now stood a screaming girl.

The sun didn't shine in all around but leaked in through holes in something that looked like very smooth river banks only that they were white instead of pretty muddy colors, and no sweet flag, with nice-tasting roots, there.

Then there were the funny two-legged things that began to chase him from place to place. One had a broom, the other a wastebasket and an inkwell, although the little muskrat had never heard of either. He reeled with fear. At last the dreadful thing with the wastebasket plumped it down over him. Frantic with fear, the little muskrat bit at it with his long yellow teeth but it was made of something very hard so that it hurt his mouth and he had to quit. He couldn't push it up although he scratched at it with his little paws. It was no wonder he couldn't move it for at least three of the two-legged beings were exerting all their strength to hold it down. The little muskrat subsided into what looked like sullen defiance but was really the result of his heart beating so hard that he could barely breathe.

THE WANDERER SURVEYED HIS SURROUNDINGS
He lived a life that had a sad ending because he took to the open road to explore.

Eventually they brought him to the Museum, still under the metal wastebasket, now resting on a board. A trail of excitement came after him and for hours the place was kept buzzing by those who came to see the beast that had scared a whole office force into hysterics.

We tried to feed him but he was too scared to eat. We sent the wastepaper basket back and put the little muskrat into a temporary cage made of boxes and pieces of netting. We weren't going to keep him, but we did want a few pictures before we took him back to the creek. We hoped that in a day or two he would become a bit friendly, but he had been so badly treated. Two days slid past and though he was a wee bit friendlier he slapped at us with his tiny brown paws and he got into the darkest corner the minute we came near him. He would eat but the tiniest bit of fruit and drank a little water when we were not near him.

Then on the third night he exerted all his strength and broke out of his cage. He went on a tour of investigation, which was unfortunate, for as he was going up the stairs he met the night watchman coming down, and thinking he saw a hideous rat, the night watchman killed it. And that was the sad end of the little wanderer.

IMPORTANT ANNOUNCEMENT FOR THE CAMP WORLD

In full appreciation of the summer camp as a vital factor in education, conservation and good citizenship, and recognizing that Nature Education is the key to good camping, the American Nature Association is pleased to be able to announce that Dr. William G. Vinal has been attached to its staff for special Nature service for camps during the coming summer.

Organization of the Nature lore phase of camp work has frequently been a stumbling block for directors. The scarcity of Nature leaders has been one cause. To assist in the solution of this problem and to provide all helpful suggestions possible, Dr. and Mrs. Vinal will visit about fifty camps on a lecture tour. In order that these visits may be really useful it is necessary to limit them to this number of select camps, who request this service from the Extension Department of the American Nature Association at Princeton, New Jersey.

Dr. Vinal needs no introduction in the camp world and in obtaining his cooperation, and thus making available this service, the American Nature Association feels that it will be able to make a distinct contribution to camp work and to education in Nature.

TARANTULA AND TARANTULA HAWK—CHALLENGERS
In the battle that ensued after this picture was taken, both were killed. Photograph slightly less than natural size.

TARANTULAS AS PETS

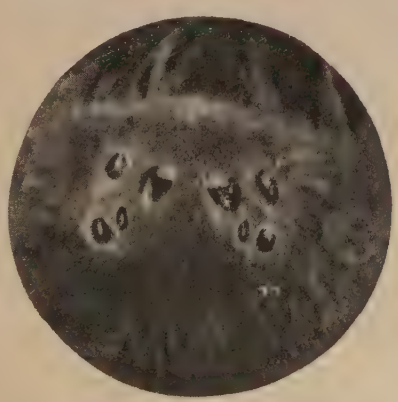
W. J. BAERG

University of Arkansas

THAT these large hairy spiders have acquired such an exceedingly bad reputation is of unusual interest to the student of outdoor life. As a matter of fact, they are not at all hideous, except in the minds of many people. If one can overcome the horror of tarantulas long enough to get acquainted with them, they will become charming creatures. They are harmless, have many interesting habits, and really a very pleasing appearance.

All through the southern states, wherever tarantulas occur, people have a horror of them. Stories regarding the deaths caused by the bite of these spiders are common and many of them are rather gruesome. Thus, Mr. Swift told me that an acquaintance, Mr. Steele, attended the funeral of a little girl. At the grave the heartbroken mother related that her daughter had been bitten by a large tarantula, and after indescribable suffering had died on the following day. References to the universal horror of tarantulas are common in literature. One meets them very often in books of travel. Writers of scientific books on spiders, for want of evidence, and out of respect for the large size of the tarantulas, say that they should be avoided.

The blackish tarantulas that are sometimes brought to the United States in shipments of bananas are believed to be more deadly than the rattlesnake. In their native home, Central America, they are regarded in the same light. While visiting in the Canal Zone I was interested in the habits of a rather large tarantula that is quite common there. In an effort to obtain a considerable number of this species, I advertised in the local daily paper, offering ten cents for every live tarantula brought to the laboratory. Not one spider was brought in. This, in spite of the fact that the natives will gather, in addition to parakeets and monkeys, young boa constrictors to get money from our sailors or other visitors. The natives there commonly call these spiders antelopes, referring to the alleged jumping habit. Our own species are said to jump various distances, varying from ten to twenty-five feet. It is as unreasonable for a tarantula to jump as it is for a blind man. When popular opinion is unanimous and completely wrong, it is entirely logical that one should seek for explanations. Unfortunately, though I have looked, I have not found them. I am unable to say how the numerous tales of horror originated.

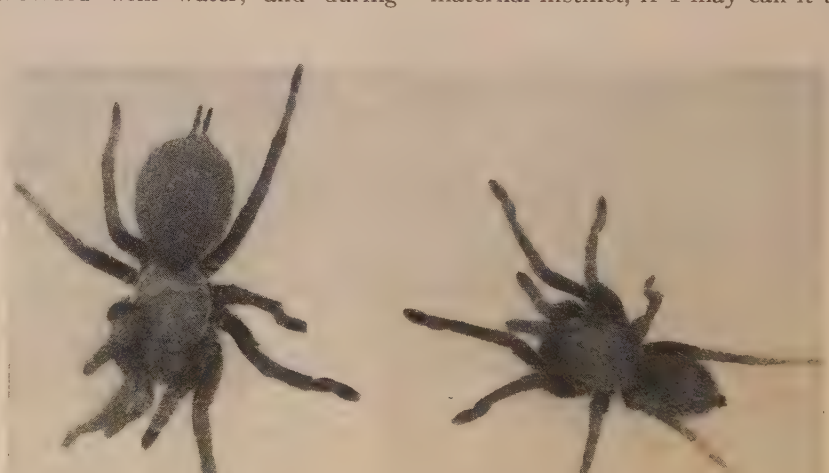


THE TARANTULA'S EYES
They are here about ten times natural size.

May I therefore, try to show why the tarantulas may well be regarded as interesting companions. One cannot exactly call them pets, for they do not respond to petting as, for instance, a cat does. Their response is more like that of a goldfish, although I regard the tarantula in every way preferable to the goldfish. The tarantula has also some decided advantages over the canary, for while the tarantula cannot sing, it does not seem to dislike captivity. A caged bird does not please many of us, because it is obviously a captive, and often shows that it longs for freedom. The tarantula does not care.

Tarantulas are common in various parts of Arkansas, Oklahoma, Texas, New Mexico, Arizona, California. They may be found in burrows or under stones on hillsides. The burrows they either construct themselves or appropriate from a gopher or other rodent. Near the University of Arkansas there is a colony of twelve or more tarantulas that live on a stony hillside. It seems they prefer ground that is fairly free from weeds and grass, and only partly shaded. The various tarantulas that I have under observation are kept in large battery jars. These are partly filled with soil and are covered with a screen-wire top. The soil furnishes amusement to the spiders, for they like to dig long and winding tunnels. All through the year they must be provided with water, and during spring, summer, and early fall they are fed every five or six days. For a meal a full grown tarantula takes a large live grasshopper, or two small ones. A large cockroach is rather a delicacy. To simplify the matter of providing food, cockroaches are reared and kept in wire cages. These are especially suited for the young tarantulas that would not undertake to attack a live and kicking grasshopper. When sufficiently hungry, the tarantulas will accept a catalpa worm, but they seem to regard caterpillars as rather inferior articles of diet.

NEARLY FULL-GROWN TARANTULA AND COCOON
He is estimated to be about 14 years old. The cocoon contains between 600 and 700 eggs.



YOUNG TARANTULAS ABOUT LIFE SIZE
They are about five and four years old and interesting youngsters if you like them.

The tarantulas apparently find captivity very agreeable and are easily kept in good condition. One of them which I have called Jael (there is a good deal of determination in her disposition) has been in the laboratory now for nearly seven years. Its age I am estimating at fourteen years. Another one, the largest that I have, is probably at least sixteen years old, and possibly much older. On account of its great age it has been named Mrs. Methuselah. Its body measures two inches and a half in length. The ages as estimated are based on observations on the rate of growth, especially in the young spiders.

In the fall, late in September and in October, the males and females mate. In the following summer each female deposits from six hundred to seven hundred eggs, which are placed in a thick-walled cocoon. At this time the tarantula shows considerable interest in the welfare of her offspring. In the field the females may be seen during the day guarding the cocoon which has been placed near the entrance of the burrow. It seems that sunlight aids in the hatching process. If a guarding female is disturbed she will hastily move the cocoon to the bottom of her burrow. If cornered she will rear, open her fangs and prepare to defend her brood. This maternal instinct, if I may call it that, is rather unstable. When a female is disturbed in the process of egglaying, she is quite likely to devour all the eggs. When I took a cocoon away from a female several times, opened it to count the eggs and observe hatching, she became weary of my interference and devoured the whole mess.

The young, for the first half year, grow but very little, then for four or five years they grow rather rapidly. During this time they shed the skin, or molt, about twice a year. Later they grow very slowly and molt but once a year. Chance for survival of the young spider is exceedingly small. In the colony of ten to twelve females, that I have observed for a number of years, probably not more than two or three out of five thousand young live to maturity, or an age of seven or eight years.

Molting is a very critical time in their life. For several days preceding, the spiders appear ill, they sit very still and refuse all food. On the day before molting, they often lie on their back and when picked up are entirely limp. The molting process begins when the up-

per skin of the fore part of the body (from its resemblance to the upper covering of the turtle it is called the carapace splits along the side; through this opening, which gradually widens, the tarantula gradually oozes out. The process requires about an hour. The skin over the abdomen is very thin and delicate. During the molting process it may tear and the spider quickly bleeds to death.

Since the tarantulas shed their skin periodically as long as they live, they possess the great advantage of being able to replace lost appendages all their life. For instance one tarantula lost the left hind leg in August, 1921. A year later when she molted a new leg appeared. It was rather short and slender, but was used like the others. In this matter of replacing legs, the tarantula follows the example of crawfish. When a leg is wounded anywhere, the spider discards the whole leg a few days later and then proceeds to grow a new one.

The entrance to their burrows or to their residence under a stone, is during spring and summer usually covered over with a thin silken dome. This is a reliable sign that the owner is at home. In some instances the holes are merely lined with silk around the edge. In either case it is very easy to recognize the holes occupied by tarantulas. In these holes the spiders spend most of the daylight hours. At night, except during the winter months, they come out to forage. The males during the mating season may be seen in the day time outside of their holes.

A LARGE FELLOW FROM THE CANAL ZONE
This picture falls only a little short of doing him full justice as to size. Dr. Baerg recommends these pets.

In foraging, as well as in finding the other sex, the tarantulas rely entirely on the sense of touch. If a grasshopper comes in contact with one of the legs of the tarantula it promptly rears on the four hind legs and then with great swiftness strikes the insect with the front legs. One can easily observe this by touching a hungry tarantula on the front legs or pedipalps. It is well to use a little caution here, for the tarantula may bite soon after striking.

It seems a remarkable feature that although the tarantula has eight eyes it does not use them any more than a blind man does his. It distinguishes day and night, and that is all. When out walking or hunting it uses its legs as a blind man uses a stick; that is to say, the tarantula carefully feels its way as it walks along. That is why I have said that it is about as unreasonable for a tarantula to jump any distance as it is for a blind man. Regardless of the eight bright eyes the tarantula sees no more than an earthworm which has no eyes, and yet knows when it is day or night.

Bright light has a striking effect on these large spiders. In Ancon, Canal Zone, where they may be seen at night sitting in front of their burrows, I learned that a bright light, such as given by a small acetylene lamp, seems to charm them. They sit quite still, even though the light be held very close. By taking advantage of this, I had no trouble in getting many specimens; for while they were dazzled by the light I would put my hand in front of the burrow, and finding their retreat closed they would sit still and allow themselves to be put in a suitable container.

Their response to bright light has another advantage. They are a delight to the photographer. Although the spiders when taken out of their earthen domiciles appear to be exceedingly nervous and agitated; once under the lamps furnishing the light for the exposure, they at once sit quite still. This applies to both young and old ones, but more to the latter.

One reason the young tarantulas have but a slender chance for survival is that they seemingly have difficulty in securing suitable small insects to feed on. In the laboratory they are very difficult to rear. The task of providing a constant supply of such insects as plant lice is not very easy. Even when this is done, the young tarantulas rarely survive. When the spiders have reached the age of two years they are easily cared for. They will then readily secure a grasshopper, cockroach, or caterpillar placed near them.

Out of doors the existence of even the older tarantulas is very precarious. A large wasp with black body and reddish-orange colored wings collects tarantulas

for the larder of its own offspring. The wasp is known as Pepsis, or tarantula hawk, and as may be seen from the illustration (the tarantula is about two inches in length), is rather formidable in size and appearance. When the wasp attacks the tarantula, the latter makes a strong effort at self-defense. Many people who have observed such a combat consider it a remarkable performance. If the wasp comes out victorious she places the paralyzed tarantula in a burrow where it furnishes food for the progeny of the wasp. Commonly neither the wasp nor the tarantula comes off victorious.

Easily the most dangerous enemy that tarantulas have is man. Nearly everyone when meeting with one of these handsome creatures, if he has any courage, will promptly kill the spider. Such an act is then considered of sufficient importance to have a place on the first page of large daily newspapers.

Regardless of the fact that fear of tarantulas has persisted since ages long past, and is now prevalent all over the earth, it is nevertheless largely without foundation of facts. The tarantula that is most common in the southwestern United States is entirely harmless. It will not bite when handled. During a period of eight years I have taken many of these, have handled them frequently, and have never been bitten when I handled them. I have been bitten several times, but only when I induced them to bite. This was done in an experiment by which I learned that their poison has no noticeable effect on man. In these tests I learned also that as a rule it is rather difficult to induce the tarantulas to bite. Often they must be teased for a good while to make them cooperate.

Our tarantulas, therefore, may well be considered as interesting outdoor neighbors that deserve protection. They are harmless to man. In fact, they are better than harmless for they feed on many insects such as grasshoppers and others that are destructive to crops. There is nothing in their habits to make them offensive or undesirable, and much to make them interesting and good.

Jack Rabbit As A Sprinter

By Harold J. Cook

FORTY-FIVE miles an hour even for a short distance is pretty good speed. Have you ever wondered as you watched a Jack Rabbit go hopping over the snow, just how fast he was getting there, wherever it was? Opportunity came to the writer to settle this vexed question and to tell the world just how fast a Jack Rabbit *can* run, and reduce to concrete terms the age-old saying: "He can run like a Jack Rabbit."

This momentous question was settled out in western Nebraska in midwinter. A wild snowstorm had raged the previous night and the car faced a gale blowing at the rate of forty or fifty miles an hour. At this point the state highway runs along the top of a high ridge which was blown bare, the snow drifting deep in the ditches and along the banks on either side. Suddenly there darted out ahead of the car, into the teeth of the sleety, blinding wind, a large, white-tailed Jack Rabbit *(Lepus campanius)*. Now Jack seemed keen for a race, but knowing the way of a rabbit, he was allowed thirty yards' lead. How that rabbit could go! He held the lead for about one hundred feet, the car's speedometer registering thirty-five miles an hour, and Jack actually gaining on the car. The car was speeded up to forty miles an hour. Still Jack Rabbit held the lead. However he was plainly doing his very best and running under strain. A quarter of a mile and he began to lose ground a little, became panicky, wabbled with evident indecision, then dove to one side into a snowdrift. But it was established that, given favorable weather conditions and for short distances, Jack Rabbit *can* easily make forty-five miles an hour.

(PHOTOGRAPH J. C. ALLEN)

HE IS A REAL SPEEDSTER
White-tailed Jack, whose home is on the high plains, is timed for his speed at short distance running.

With the springtime the sap courses through the arteries of the trees,—but why and how? The answer to this query lies in the limbo of the mysteries of science. Man has not yet fathomed it or answered it. In this article, however, Mr. Gill interestingly marshals together the facts that we do know.

THE LIFEBLOOD OF TREES

By Tom Gill

PHOTOGRAPH U. S. FOREST SERVICE

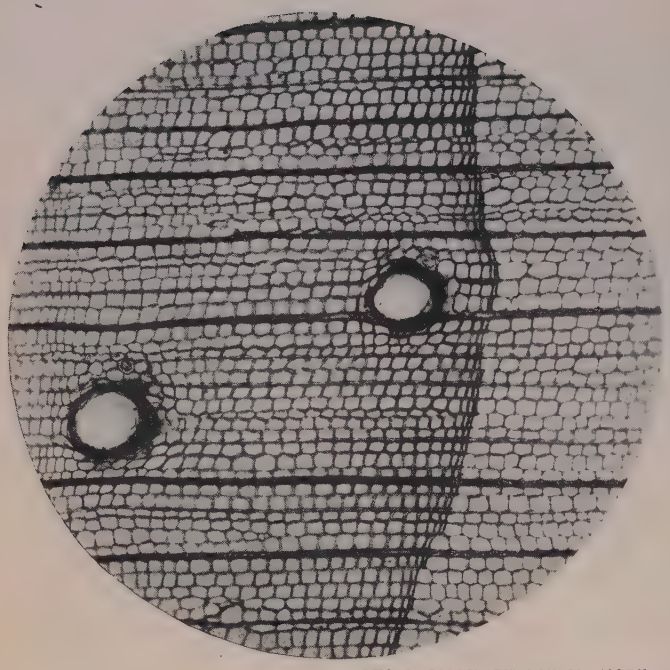
GROWING WITH ITS TOES IN THE WATER
Each leaf in this willow is busily manufacturing plant food and drawing upon the water supply.

EVER since the law of gravity decreed that water must not run uphill, trees have played the rôle of recreant. In tree trunks the sap rises seemingly in direct defiance of this edict. And since science insists on finding some rational explanation when well-defined laws of Nature appear to be violated, she has persistently tried to explain the hidden forces that cause the upward flow of this vital fluid in living plants. But in spite of patient search and research there exists still in Nature many a shadowy borderland country only dimly lighted by our actual knowledge of material things and only scantily defined by our cleverest theories. The forces that lie imprisoned within the atom; the problem of the ultimate nature of matter, the age-old question as to the origin of life itself—all these belong somewhere in that unexplored, uncharted country to which science has found only indifferent guides. It is well to admit that such enigmas still challenge our most careful investigations, especially when attempting to discuss what the great Darwin himself called "that most nebulous of subjects."

So familiar has this fact of the rise of the sap stream become in our daily living that only those who have tried scientifically to explain its processes have come to realize its baffling complexities. Popular misconceptions on the subject are numerous. To-day, no less than twenty years ago, your practical woodsman speaks of the sap being "up" in summer and "down" in winter, although in truth there is less sap in trees during the warm months than at any other time. In the case of sap you have one refutation of the old saying that whatever goes up is sure to come down; for a great deal of the sap that goes up never returns to earth. Here, of course, I am using the word "sap" rather loosely, as is generally done, to mean any moisture that a tree may contain. As a matter of fact the fluid that ascends a tree is practically the same as the water that lies in the soil and flows in the streams, and only when it has been subjected to the mysterious chemical changes that take place in those green laboratories, the leaves, may it strictly be known as sap. After these changes it starts on its downward course laden with food material —starches and sugars, cell builders and wood producers. And long before it arrives at the base of the tree, whence it started, most of this material has been deposited and most of the water itself has been evaporated. So the original fluid that goes up the tree never comes down again. And when in the autumn the leaves fall and the sap ceases to circulate it is held motionless in the trunk of the tree and in the branches, there to remain throughout the winter, waiting for the coming of the leaves to bring it into action again. Practical woodsmen to the contrary, sap does not "go down."

I have called the leaves laboratories. They are, in fact, something more. They serve as chemical factories where the lifeless, inorganic material taken from air, sunshine, and soil is transformed into the living, organic material that makes up the plant. If we knew just how this is done we might have some inkling as to the nature of that mysterious process we call life. But we only know that this translation from the lifeless to the living which takes place, *presto chango,* high up in the branches is due in some manner to the chlorophyl, those little green bodies that give the leaves their color.

The green grains of chlorophyl, microscopically small, have the power to screen out all the light rays



PHOTOMICROGRAPH ROY M. ALLEN

VEINS AND ARTERIES OF THE PINE
This "close-up" shows the wood fibres, annual rings, and resin ducts of the tree.

except the red, violet, and indigo. With these they act on the tree's raw foodstuffs. Out of the atmosphere come minute particles of carbon dioxide, and from the ground beneath comes water and small quantities of mineral. Concentrating the useful rays of sunlight as with tiny focussing lenses, the chlorophyl breaks up the carbon dioxide into carbon and oxygen and unites the carbon with water to form grape sugar. Every forest tree, every potted plant, constantly carries on this process; but in the laboratories of man, the separation of these chemical elements requires a temperature of 1,200 centigrade—a heat that melts the hardest steel! Much of the grape sugar is turned into starch and stored in cells for future use. Twenty pounds of starch are manufactured by an average tree in the course of a day. A third substance made is inulin, which closely resembles starch. Out of these three substances, derived from air, water, and sunlight, the dense body tissues of trees are fashioned. Giant sequoias that had withstood a thousand storms before Christ was born; tropical trees with wood so flint-like that no nail can pierce them—these no less than the tiniest, most delicate fern have been built up cell by cell in a kind of microscopic agglomeration of insubstantial materials, transported and laid down by the sap.

Here, then, is the sap's most important function: first to bring to the leaves the raw foodstuffs derived from the soil; and second, when its tissue-building materials have been prepared by the leaves, to nourish the whole body of the tree. It is truly a vital task.

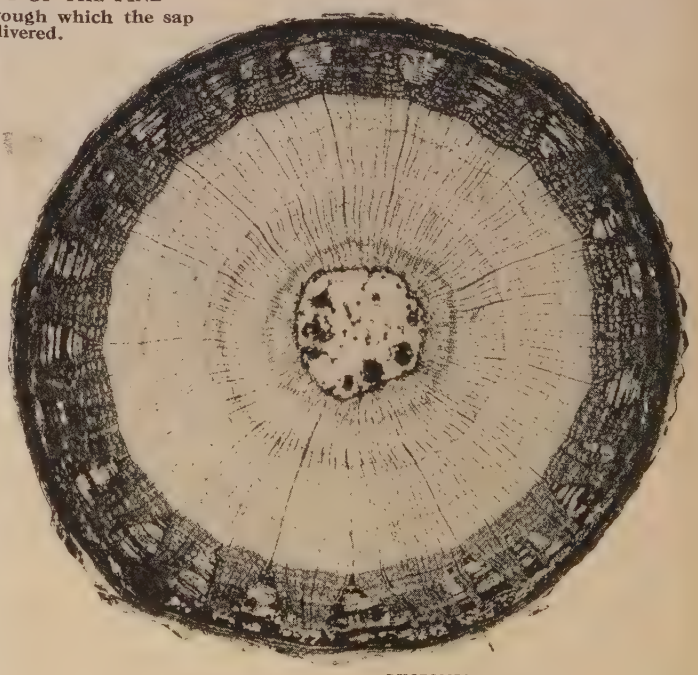
PHOTOMICROGRAPH ROY M. ALLEN

THE CHEMICAL LABORATORY OF THE PINE
This picture shows the tubes through which the sap from the roots is delivered.

More recently it has been found that the circulation of sap serves a less obvious, but vital, purpose, like that of the circulation of water in the radiator of an automobile. A tree, in a sense, is no less a machine than an automobile or turbine. It is a tissue-building engine, and the chemical changes carried on within it generate heat. Added to this is the heat of the sun's rays, which alone would rapidly shrivel a plant to a lifeless husk were it not for the circulation and evaporation of water. Experiment has shown that if heat is allowed to accumulate in a leaf unchecked by evaporation the temperature rises at a rate of twelve degrees centigrade a minute. The results, of course, are very rapidly fatal to the plant.

The amount of water taken from the soil by a tree in the course of an active summer day is enormous. Average trees fifteen inches in diameter and fifty feet high possess a leaf area of about one-third of an acre —nearly fifteen thousand square feet. Now the amount of water that rises is largely dependent on the amount these leaves can use, and our average tree contains 1,220 pounds of water. It probably lifts out of the soil about 125 gallons of water a day. An oak tree with an average of about seven hundred thousand leaves gives off 120 tons of water a season. A single full-grown maple or linden will evaporate as much as a barrel of water in a single day. So it seems quite probable that the volume of water constantly rising into the air from the world's vegetation is scarcely less than that carried by all the rivers of earth.

R. D. Forbes recalls



PHOTOMICROGRAPH ROY M. ALLEN

SECTION OF A STEM OF BASSWOOD
The path of the sap is mostly through the outer, dark portion known as the cambium.

measurements made on a mature birch tree which revealed that during a single hot day more than one hundred gallons of water were given off by its two hundred thousand leaves. By simple mathematics Forbes shows that one hundred such trees, standing on a single acre, would drain the soil of ten thousand gallons every twenty-four hours, a deficit requiring about one-third of an inch of rain a day to replace.

Sap ascends a tree with startling rapidity. Actual measurements on eucalyptus and other species indicate that the rate is often thirty to forty feet an hour and in some instances fifty. Now a column of sap within a tall eucalyptus, say 330 feet high, represents a weight of ten atmospheres, or about 150 pounds to the square inch of columnar area, and to raise such a column at an average rate requires a force of about three hundred pounds a square inch. This is far greater than the force exerted by any suction pump that has ever been developed by man.

Not all trees have equal power to draw water out of the soil and raise it through trunk and branches. The degree to which a given species possesses this power is one of the characteristics determining where it can grow. The soil itself exercises a pull on the water within it, and before a tree can secure a drop of water it must counteract this opposing force. Soils differ in the tenacity of their hold on water, and as the moisture content decreases the soil's grasp on what is left becomes tighter. Obviously, when a tree must use a great part of its strength to wrest water from the soil it has less strength remaining to raise the water above the soil. Under these circumstances the tree will be shorter than others of the same species more fortunately situated.

PHOTOMICROGRAPH ROY M. ALLEN

VEINS AND ARTERIES OF THE OAK
The microscope discloses the apparatus with which the tree carries its lifeblood.

The average heights attained by various species differ widely. The eucalyptus towers four hundred feet or more above the ground, twenty times as tall as the common dogwood. These characteristic heights are determined by the ability of the species to draw water from the reluctant soil and to raise it to great heights. The stature attained by the eucalyptus and the giant sequoias is possible only because of an unbelievable power to raise a column of water.

The tremendous force which green plants exert in raising water from the soil was demonstrated by Detrouchet. Cutting a grapevine from its stem, he tied a bladder over the end. Within a few hours this bladder was filled with sap, and a little later the pressure became so great that it burst. Through this experiment Detrouchet determined that the force with which sap mounts the stem of a grapevine is five times as great as that of the blood stream in the large artery of a horse.

For many years scientists have tried in vain to find out what causes the rise of sap. Detrouchet, after years of patient investigation, wrote regretfully at the conclusion of his experiments, "The

PHOTOGRAPH U. S. FOREST SERVICE

GIVING LIFEBLOOD FOR HUMAN NEEDS
Resin and turpentine are obtained by wounding southern pine trees and collecting the resinous sap.

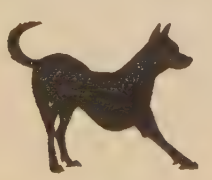
phenomenon of the rise of sap still remains without any plausible explanation." Many fine-spun theories have been offered. Some have thought that it is a kind of pumping action of the roots; others, a suction that these roots exert. Neither of these theories has been very definitely formulated. And even granting that the roots give the soil water its necessary start on the upward journey, what keeps it going? And when the sap water reaches the topmost leaf, what mysterious machinery reverses it and starts the stream with its burden of manufactured food down the twigs and the trunk? Let us consider, therefore, some of the theories.

PHOTOGRAPH U. S. FOREST SERVICE

THE BEECH PERSISTS IN CARRYING ON
Its rootlets, seeking moisture, have woven a thick mat about every patch of soil.

Perhaps the explanation most commonly favored was the theory of capillarity, which assumed that the water rose in the trunk just as oil rises in a wick, through the tendency of liquids to ascend in narrow tubes and crevices. But the difficulty here was that capillary attraction couldn't begin to raise water high enough or fast enough to account for the ascent of sap in a plant. Later, Dixon, a British scientist, found that by sealing a column of water in a glass tube he could make it carry considerable weight. Ordinarily a stream of water is extremely unstable; but with air excluded Dixon found that a water column would support a strain of several hundred pounds a square inch. The similarity of these conditions and those found in the stems of plants seemed suggestive, since the fine fibres of plants are really exceedingly slender tubes connecting with each other from the ends of the farthest root hair up to the leaf canopy. So it is not impossible for the evaporation from leaves to exert a pull on the water in the tubes, which, transmitted through these fine cylinders, might draw the water up as rapidly as it was needed. This theory, though not susceptible of actual proof and not entirely satisfactory, at least presents more valid reasons for this mysterious defiance of gravity than any other. Some investigators have felt that in this ascent of the sap stream a force over and above all chemical and mechanical forces was mani... Then in 1922 Sir Ja... dis Bose, a Hindu wid... ly known for his in... vestigations in plant physiology, announced after minute experimentation that the rise of sap results from the activities of the living cells. The cells in the active layer of a tree, Bose declared, work with a throbbing pulsation, alternately expanding and contracting and with each throb absorbing water from the cells below and expelling it upward. In the light of this theory one might look upon a tree as a lofty ladder of microscopic pumps, each engaged during the season of growth in raising its tiny burden of water from beneath and passing it to the pump just above. By later investigators this pulsation theory has been vigorously attacked. No one, it is said, repeating Bose's experiments, has been able to secure the results he described.

I have compared the flow of sap in a tree to the circulation of blood in an animal. Some object to this analogy as unsound, but we do know that it is true to a limited extent at least, and as we learn more of the hidden forces of plant and animal life we may find that the differences between the two life forms become unimportant. Casually considered, the animal and vegetable worlds seem to lie absolutely apart from each other; yet in the twilight zones of scientific research there exist organisms that cannot well be classified. So it is that science makes use of such terms as "plant-animal" and "animal-plant," indicating a number of living things that are identified with one or the other kingdom, not because science is very sure that she has put them into their proper compartments, but because science likes to be tidy and systematic. Only recently research is said to have discovered and actually measured a death quiver which takes place in plants just at the instant when life leaves. So perhaps we ought not to be quite unprepared to find that the sharp and rather arbitrary distinctions set up between plant and animal may in the light of further knowledge ultimately break down. So still the mystery of sap is unexplained.



So enthusiastic were many readers about the article on how to bring up a puppy, published in the September, 1926, issue that we asked the author, Josephine Z. Rine to tell how to train the puppy. The story, Trixie Goes to School, will appear in the April issue. No dog-owner should miss it.

LOOK FOR THEM IN THE MARCH SKIES

This constellation is responsible for our present-day expression, "By Jimini."

The Twins and the March Skies

By Isabel M. Lewis

THE constellation of Gemini, The Twins, is one of the zodiacal constellations lying in the path of the sun, moon and planets and it will be found directly north of Canis Minor, The Little Dog, and nearly overhead in the early evening hours of March. This is the constellation through which the sun passes when it is farthest north in June at the beginning of summer.

Gemini probably received its name from the fact that its two brightest stars, Castor and Pollux, are close together and very nearly equal in brightness. Pollux, the brighter of the two stars, is one of the twenty brightest stars in the sky. There is some reason to believe, though, that in early times Castor was as bright as Pollux or even brighter, because it is known by the name of Alpha Geminorum while Pollux is Beta Geminorum. It was a custom among the ancient astronomers to give the name of Alpha to the brightest star in a constellation while the star next in brightness would be known as Beta. Castor is also the more interesting of the two stars for even a small telescope will show it to be made up of two stars which are revolving around a common center.

Each of these stars in turn is made up of two stars, though the stars in each pair are too close together to be separated by the telescope. It is a little instrument called the spectroscope, which spreads the light of a star into a spectrum, that tells astronomers that each of these stars is double for it shows the light of two stars in place of one. The star Castor, then, is really made up of *four* suns all revolving about a common center. Of course the ancient astronomers knew nothing of this for they had none of the instruments that are today telling astronomers so many secrets of the stars.

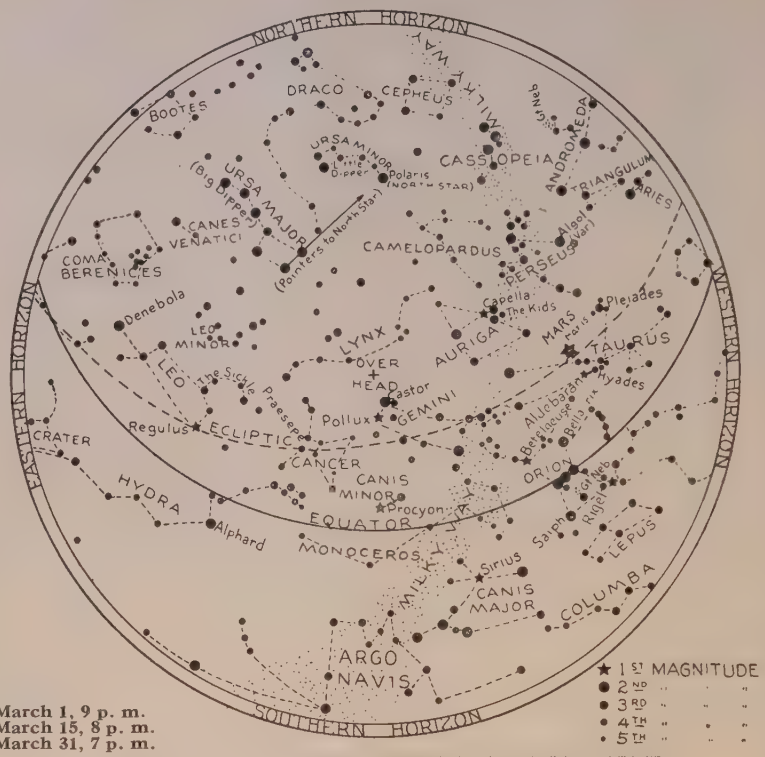
Castor and Pollux are quite near to the earth, as star distances go. The light of Pollux takes about thirty-two years to reach the earth, traveling at the rate of 186,000 miles a second. Pollux then, is thirty-two light years, or about 190 trillion miles, from the earth. Castor is about forty light years, or 240 trillion miles, from the earth, and its light takes forty years to reach us. Most of the stars in the heavens are hundreds and thousands of light years distant from the earth and their light takes hundreds or thousands of years to reach us even though light is traveling so fast that it can dart around the earth nearly seven times in a single second. So when a star is only fifty light years or less distant from the earth it is considered to be a rather close stellar neighbor.

In ancient times Castor and Pollux were considered to be the patron deities of seamen, and their effigies were often placed on the prows of vessels and their aid was invoked in storms. They were supposed to have been the brothers of Helen of Troy and to have been members of the expedition of the Argonaut. When the vessel was almost wrecked by a storm on the return voyage it was said that Orpheus besought aid of Apollo with his lyre. Apollo then caused two stars to appear on the heads of the twins and the storm immediately abated. The electrical displays known as Saint Elmo's lights that sometimes play about the mastheads of ships in storms were believed by superstitious seamen to show the presence of the twin brothers and was considered to be a good omen. In addition to being the patron deities of sailors Castor and Pollux were also great warriors and their aid in battle as well as in storm was often sought. The expression "By Gemini" was a very common one in ancient times, and the "By Jimini" which many of us have heard and possibly even used ourselves, is but a corrupt form of the ancient expression.

All of the brilliant constellations of winter months—Orion and Taurus, Canis Major and Canis Minor, Auriga and Perseus—are now in the western half of the heavens, though Procyon, the Little Dog Star in Canis Minor, is nearly due south. Directly above Procyon in the direction of the zenith are Castor and Pollux, The Twins. In the northeast the Big Dipper in Ursa Major, The Greater Bear, is swinging upward and The Sickle in Leo, harbinger of spring, is high in the east.

The eastern half of the sky lacks the splendor of the west but the nights are becoming pleasanter for star-gazing and all of the sparkling gems of winter skies—Aldebaran and Capella, Betelgeuse and Rigel, The Dog-Stars and The Twins—will be visible for some weeks to come. Against this brilliant array of stars of

first magnitude in the west and south we find but one first magnitude star in the east, Regulus in Leo, though Arcturus in Boötes will soon be seen rising in the northeast. On a clear, dark night the coarse cluster of stars in Cancer known by the name of Praesepe, The Bee-Hive, may be seen even without the aid of a telescope as a faint cloud of light. It lies only a short distance southeast of Pollux and an ordinary opera glass will show it to be a cluster of many stars just beyond the reach of the naked eye. The Milky Way is now particularly beautiful on a moonless night, arching high across the heavens from Argo Navis, the brilliant constellation of the southern hemisphere, just appearing in part above the southern horizon, to Cassiopeia in the far northwestern sky. Its course may easily be traced on a clear night between Sirius and Procyon, across the feet of Gemini, past the horns of Taurus and through Auriga and Perseus where it is unusually brilliant.



March 1, 9 p. m.
March 15, 8 p. m.
March 31, 7 p. m.

TO USE HOLD OVER HEAD WITH TOP TOWARD NORTH

Among the planets, Venus may now be seen immediately after sunset in the west setting about two hours after the sun by the end of the month. Venus is now on the far side of its orbit from the Earth and is not in its most favorable position for observation but, as always when in view, it is the most conspicuous object in the sky and will increase in brilliancy as the weeks go by. In the telescope it now resembles the gibbous moon in appearance.

Mars is still conspicuous in the evening sky in Taurus. It is now almost exactly equal to Aldebaran in brightness and about the middle of March it will be found due north of it and only a few degrees distant. As the two objects are both red in color their resemblance will be striking at this time. It is interesting to remember, though, that while Mars is a small planet only about half as great in diameter as the Earth, the star Aldebaran is a giant sun with a diameter of nearly twenty million miles and with a temperature at its surface of nearly six thousand degrees Fahrenheit.

Jupiter comes into conjunction with the sun on March 1 and will be too close to the sun to be seen throughout the month. Mercury also will be too near the sun to be seen this month. Saturn is now in Scorpio and is in fine position for observation after midnight.

On March 21 at 9:59 A. M., Eastern Standard Time, the sun will cross the equator coming north and spring will begin in the northern hemisphere and autumn in the southern hemisphere. On that day the length of day and night will be equal all over the world as a celebration.

HALVES of coconuts make admirable feeding stations for birds, writes L. H. Somers, head master of the Adirondack-Florida School, and he sends in the accompanying picture by way of proof. The squirrel, however, was not the guest for whom the seeds on the feeding station were originally intended but he made himself quite at home. In fact, he usually got more than his share of the food, making several visits during the day. This particular feeding station, which combines with the coconut half the wire netting suet rack, is shown fastened to a small leaf oak, plentiful in southern Florida.

NATURE EDUCATION

PROF. E. LAURENCE PALMER, CORNELL UNIVERSITY, DIRECTOR

ASSOCIATES

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PROF. J. A. HOLLINGER, President, National Council of Supervisors of Nature Study and Gardening.
MRS. ELIZABETH K. PEEPLES, of the Washington, D. C., Schools.
PROF. L. D. WOOSTER, Kansas State Teachers College, Hays, Kansas.
MISS CLELIA PARONI, Supervisor of Nature Study, Berkeley, Calif.
DR. BERTHA CHAPMAN CADY, Girl Scouts, Inc.

Nature and Health Text

A book for school children on Nature Study and Health Education by Alice Jean Patterson, Director of Nature Study and Elementary Science in Illinois State Normal University, and author of several books on Nature and Science, can not fail to be of interest to educators.

"Nature Study and Health Education" for the fifth grade is one of a series of texts for the elementary school. The purpose of the books is twofold: first, to plan a series of Nature and health lessons simple enough to place in the hands of children, and thoroughly interesting to them; and second, to arrange workable lessons for the teacher so as to reduce her work to the minimum.

Because of the character of the material the Nature Study phases of the material are emphasized in the Fall and Spring months; and, while health education is not lost sight of at any time, the winter months are devoted almost exclusively to this phase of the work. The lessons naturally fall into three distinct types—conversational and experimental, and expressional. In order to make use of the children's activities in different methods of expression, a pupil's notebook accompanies the text. A teacher's manual has also been arranged. In all the work the handling and study of real Nature objects is planned, not the mere reading or talking about them.

* * *

Nature Study, What and Why?

Professor Wooster of Kansas State Teachers College of Hays says, "Nature Study means just the simplest and most natural thing possible, namely, paying attention, day by day, to the thousand-and-one things in Nature which we (children and all of us) naturally find of interest, and about which we instinctively desire to know. We should teach it in our schools, because of all the subject matter of education, nothing compares with a knowledge of the facts and laws of nature in importance to life and living. It is fundamental."

* * *

The Museum and Nature Study

The Museum is performing an important function as an educational institution. The privilege of taking advantage of the Museum's educational program is now extended to all learners, from kindergarten to research students in the University. The Carnegie Museum at Pittsburgh, Pa., enters the public schools helpfully and attractively by means of traveling exhibits which are prepared by scientific experts in the Museum. During the school term 1925-1926 the cases provided were shown in the Pittsburgh schools 1,493 times, with a recorded service to 66,194 pupils.

The exhibits consist of bird cases, insect cases, botany, ethnology and mammal cases. The cases are being improved and increased in number. Insect cases show life histories of Lepidoptera and other specimens. Some insects are grouped to show their economic values. Botany cases show corn, and corn products. Other cases are so arranged as to stimulate curiosity. Clarity, interest, and economy in learning are the chief factors in the use of these traveling exhibits.

The schools send to the Museum, three times during the year, all eight grade pupils. They are given one lesson in botany, one on mammals, and one on birds. A children's room is planned by the Museum.

WHO'S WHO IN NATURE STUDY

L. Lenore Conover

If anyone doubts that a supervising instructor of Nature Study is busy, let him glance at the following duties listed in the schedule of Miss Conover of the Detroit schools: Supervision of all Nature Study in the elementary schools; construction of the course of study for elementary schools; teaching of five courses in the regular session of the Detroit Teachers' College, and giving extension and summer courses.

Miss Conover regards Arbor Day tree planting as an item worth noting in her Nature Study program. In the last four years committees of three pupils and a teacher representing each school have planted about three hundred trees in a city forest in one of Detroit's public parks. One hundred trees have been planted in school grounds. Another achievement has been the circulation of wild flower preservation pledges among about one hundred and fifty thousand intermediate and elementary children, besides the students in Teachers' College, with an almost one hundred per cent response.

MARCH'S INTERESTING THINGS

By E. Laurence Palmer

(Illustrated by R. Bruce Horsfall)

WHEN one hears the word "March" he wonders whether it means "Forward, march" or "Backward, march," and the month itself, so far as Nature is concerned, seems unable to decide which of these commands to obey. During some days it looks as though the season were doing the "double-quick" towards summer and at other times the reverse seems to be the case. Of course this depends to some extent upon the part of the country in which we live.

NEWTS MAY BE FOUND
Turn up the logs in the woods and see what you can learn.

Former March numbers of Nature Magazine have given you help with such appropriate topics as newts, red squirrels, dutchman's breeches, tornadoes and maple sugar and if you can't go to Nature herself for help on the questions I am raising now then go to Nature Magazine, the next best thing to Nature itself, we hope.

Many of the red newts which you found under the logs in the woods last summer may have changed into the brown adult form by now and will be mating and laying eggs for a new generation. In the case of the eastern newt it will be three years before the creatures that arise from these eggs will lay their first eggs. About two years of this time will be spent on land in the red newt form. You should be able then to find the eggs, the red land form and the brown adult water form all in the month of March. How do the tails of the land and of the water forms differ and how do the sexes of the adult forms differ?

From red newts to red squirrels is quite a leap but the squirrels ought to to be able to make it if the newts can't. Possibly the squirrel might make the leap with the newt since the squirrel will eat a great variety of things. Not many creatures seem to crave feeding upon the adult newts however, so both newts and squirrels have something about them that guarantees their continued marauding. The adult newts maraud fish nests and the adult squirrels bird's nests and since we like both birds and fish we would prefer that the squirrels and newts desist. Fortunately the immature newts feed largely upon insects and in that way pay their way. The squirrels I suppose must pay their way by their impudent and interesting actions. By the way, did you ever notice how a squirrel uses his hind feet when hanging head downward scolding at you? Do you find young red squirrels born by March or do you find the adults chasing each other madly about in courtship antics at this time of the year?

Dutchman's breeches and squirrel corn may be decorating the woods by late March. The two flowers look somewhat alike though the "legs" of the dutchmen's breeches are more slender and widely spread than they are in the squirrel corn. It might be well if you haven't already done so to expose the roots or bases of each of these plants and see how different they are there. Please cover the roots up again and save the plants even if you think you must pick a flower or so for a button-hole bouquet. If you are interested in flower structure, you will find the flowers of each of these plants worth looking into literally. See if you can get some idea as to how pollination is brought about.

A SPRINGTIME TORNADO
The human tornado is one that injures many wild plants.

THE HICKORY BUDS OPEN
Keep a record of this process for a week; it is interesting.

While March marks the open season for spring flowers it also marks the open season for tornadoes. Unfortunately many beautiful bits of woodland look like tornadoes had struck them even though they have been visited only by those who profess to "love the wild flowers." One reader of the magazine told me the other day that he never used to like Nature much but now when he and his wife went for a ride in the country they always stopped and brought home some boughs of fruit or flowers to decorate his home. I was glad to learn that he had not developed the habit from reading the magazine but there are more serious tornadoes that

Will the Beautiful Song Birds Sing in Your Yard This Year?

Without them half the pleasure is missing. Birds abide where they feel protection and know they can obtain food and drink without danger of being molested. Under such conditions they raise family after family, singing and working the whole day long, ridding the gardens and trees of the injurious moths, beetles, mites, mosquitoes, and other flying insect pests that not only annoy you but destroy your beautiful trees, shrubs and flowers. Invariably a Dodson House placed as directed will get a colony of beautiful Martins and sweet singing Wrens. Bluebirds and Flickers take naturally to Dodson's Scientifically made houses. The beautiful Cardinals, Thrushes and dozens of others of our beautiful Songbirds will seek your garden if the kind of shelter and food they like is provided. Once you know the joy of bird friendship you will regret the years of pleasure missed.

Dodson Scientifically designed and artistic bird houses are a feature in the most beautiful estates, country clubs and parks all over America.

Why Dodson Houses Win the Birds

For more than 40 years Mr. Dodson has experimented and studied every little detail which, although seemingly insignificant, is vital to the approval of each fastidious species of songster.

A Song Bird Lover
for over 40 Years
ACTUAL PHOTO OF
Joseph H. Dodson (The Bird House Man)
Making friends with a Black Capped Chickadee at his Kankakee Bird Sanctuary

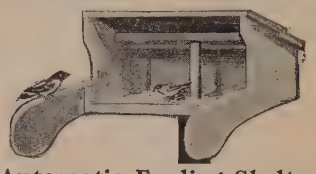
Free this fascinating book "Your Bird Friends and How To Win Them" sent to anyone who loves our beautiful songbirds. Full of things you should know. Based on a lifetime of close bird life study.

Flicker House

Is a sure lure for these very useful birds. Trees in cities are so well taken care of that Flickers have difficulty in finding homes. They, therefore, take very readily to Dodson's Scientifically Built Houses. Flickers are one of the most useful birds, destroying moths, tree pests and principally ants on trees and ground. Many letters have been received stating that ants have mysteriously vanished since these birds have found homes. House 26½ in. high by 12 in. in diameter. *Only* **$7.00.**

Dodson Scientific Wren House as shown above

The Silver Throated Wren is one of our sweetest singers. A four-compartment house satisfies their habit of changing nests for each of their three broods. Beautiful design, made of oak, finished in green with cypress shingles, copper coping, comes complete with rust-proof snap-on hanger. Size 28 in. high by 18 in. in diameter. *Price* **$7.00**



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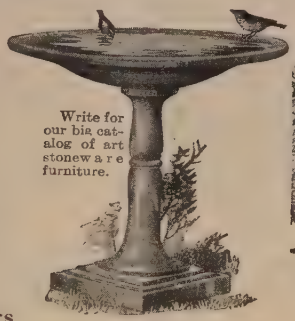

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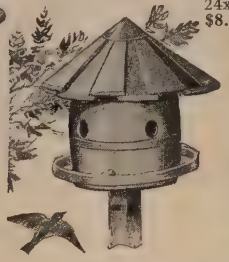

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strike our country in March than those caused by people who take a few samples here and there. Watch your newspapers during this month to see when the first tornado is reported. Is it the first of the season? Keep a record of those reported in your paper for the year and see if March and April don't bring in a bigger total than the warm months of July and August. It might be well for you to get straightened out on the differences between monsoons, tornadoes, cyclones and hurricanes. It might be fun to startle your friends by telling them truthfully that a cyclone was due to strike town soon. The March, 1924, Nature Magazine should prove interesting reading in this connection.

If you live in the part of the country where maple sugar is produced you may like trying to find out whether it makes any difference whether you tap the tree on the north side or on the south side. Since sap "flows" from many trees besides maples in March you might try tapping other trees to find out about this. Does the sun striking the trunk of the tree near where it is tapped seem to have any influence on the flow of sap? This question of sap flow is one that cannot be confined to tree stumps since it seems to be stumping the best of botanists. You may go into the subject as deeply as you like but should be careful about believing all that you read on the subject. Things such as this are what make Nature study genuinely interesting. If every thing was known the condition would be entirely different.

SAP IS FLOWING IN THE MAPLE LOT
Do you know on which side of the tree the borings should be made? It is very important.

During the last two or three months I have suggested Nature notes slightly pertinent to historical dates in the month considered. Since some of you seem to like the idea we might carry the idea along even though some of the associations may sound rather far fetched. If however, we associate February with Washington and cherry trees we have just as much right to associate March with President Jackson and with "old hickories." March is fortunately not only the month in which President Jackson was born but it is also the month in which in some parts of the country hickories may be most interesting with their opening buds. A record of an opening hickory bud for a week is almost as interesting as the record of a bursting horse-chestnut bud or a tulip-tree bud. Do the bud scales of the hickory buds develop into leaves or into leaf-parts or are they merely shed as scales? Are all bud scales similar in their behavior and development?

President Jackson and "Stonewall" Jackson of course were not the same individuals. March is slightly interesting in connection with the history of the "stonewall brigade," however, as it was in March that the famous unit met one of its earlier defeats. Since stonewalls are just as interesting in times of peace as in time of war let me suggest that probably stonewalls are more interesting in March than at any other time of year. Stonewalls have served to protect many forms of life from the tortures of winter's cold just as they have served as classic barriers to the attacks of other kinds of foes. It is from the stonewalls that many of our snakes emerge in the spring. It is from them that chipmunks dart. Over their tops clamber a variety of squirrels and vines and beneath them burrow woodchucks, skunks and other creatures.

If these things are not enough to hold one's interest, one can study with profit the rocks that compose the stonewalls. They will tell stories of all sorts including scars of battles with water and with other rocks. If you have been bitten by the "geneology bug" you might like to take up "geneological geology" and determine which of the rocks came from a common stock. Which are of limestone for example? Which are granitic; which, sandstone and so on? It will surprise you what surprises a stonewall can yield once you begin prying into its secrets. Why not make stonewalls the order of business for the investigations of your Nature club for March!

While going cross-country in search of stonewalls and fish it might be well to remember the famous cross-country ride made by General Sheridan who, by the way, was born in March. The outstanding bit of Nature associated with that ride of course was a horse and so horses might come in for their share of observation in your Nature work before they become rare through the

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increased use of automobiles. While looking over a horse you may notice on the inside of the legs some spongy pads that seem to have no use. It has been suggested that these give off a scent which comes into contact with grass and leaves a scent-trail which was useful in keeping herds of wild horses together. Are these glands on the hind legs as well as on the fore-legs? Do you find similar glands on other domestic animals such as cows, dogs, cats or pigs? Migrating birds have flash colors in their plumage which assist in keeping flocks to-to draw individuals together and various means besides scent and sight are used by various forms of life for bringing individuals together. Individual investigation on your part as to how a variety of creatures do this will be a splendid field.

Of course we should not forget that St. Patrick's Day comes in March and that the wearing of the green seems to be the order of the day by Nature generally at this time of year. Many will wear four-leaved clovers instead of the shamrock since the shamrocks do not grow here as they do in Ireland and this brings up all sorts of questions about four-leaved clovers. Some say that if you find one you can always find another on the same plant. Some say that if you pick a four-leaf clover from a plant and go back to the same plant later that you will find that it has been replaced by another with four "leaves." You can find the answers to these questions yourselves so here's wishing you "Good luck" for March.

A Progressive County

Recently the county board of Eau Claire County, Wisconsin, voted a special appropriation of five hundred dollars to be used in planting trees along the main highways within its jurisdiction, writes W. E. Snyder of Beaver Dam, Wisconsin. He says he understands that this is the first county in the state to take such a step.

Robin Is State Bird

Children of Wisconsin voted heavily in favor of the robin for the State Bird in a poll conducted by Mrs. Walter Bowman of Durand, chairman of conservation of the Wisconsin Federation of Women's Clubs. The State Bird movement is a fine one. Who's next?

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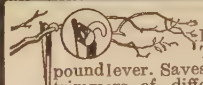

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NATURE NEWS AND VIEWS

Real Accomplishment

Through the activity of Mrs. LeRoy Barton of Port Washington, New York, assistant chairman of the conservation committee of the Federated Garden Clubs of New York State, this organization has prepared some particularly effective material to aid in the fight against three insect pests. The enemies in this instance are the tent caterpillar, the fall webworm and the bag-worm. The material consists of three posters, 11 by 14 inches, with drawn illustrations of the various stages of development of the pests. In each instance the salient features of their habits are pointed out in a few words and large type. The posters are admirable for posting up, being printed on cardboard. With each is a page of more detailed matter about each of the pests, giving instructions for gathering the cocoons as a preventive measure. Mrs. Barton informs us that a set of posters and correlative material may be obtained for fifty cents by addressing her at Beacon Hill, Port Washington, Long Island, New York. Each separate poster with related leaflet can be obtained for eighteen cents.

Making a Collection

Louis G. Flentge, 1556 Thacker St., Des Plaines, Illinois, is a young naturalist of 14 and writes in that he is desirous of making up a natural curiosity collection in all fields of Nature.

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Pink Turtle-Head

Several members have written in after reading the article in the January issue about four instances where subjects were lost to Science for many years, to the effect that they have known the pink turtle-head flower for a long time as a common plant. It should have been stated that there are about six species of this flower known to Science, five of them being well-known and one "lost" for 175 years. From the letters received it is apparent that the writers were acquainted with the common varieties. Two geographical misstatements crept into the article in putting Mathews County in Maryland when it should have been Virginia, and in placing Clayton's home on the Patuxent River instead of in Mathews County.

Our National Forests

The Federal Government now owns one-fifth of the forest land in the continental United States, William B. Greeley, Chief Forester of the United States, points out in his annual report. Nine-tenths of this is under stable administration with a definite aim of forest perpetuation and public use. This includes both national forests and parks.

"Ultimately," Mr. Greeley continues, "it is probable that public ownership and stable management of at least one-third of the total forest area of the country will be found advisable. Under the policies defined by the Weeks Act of 1911, the Clarke-McNary act of 1924, and the forest exchange act of 1922, the present national forests should be consolidated, extended over the remaining public domain that is valuable chiefly for timber production and enlarged, through purchase in regions where serious forest denudation must be overcome or national interests like the conservation of water flow protected. It is not desirable, however, to purchase additional federal holdings in regions where local needs can be met by state or municipal forests or by the extension of farm and industrial forestry."

Henderson Advanced

Walter C. Henderson has been appointed to the post of associate chief of the United States Biological Survey, a new office. He has been with the Survey for ten years in the capacity of assistant chief, devoting much of his time to administration of the migratory bird treaty. Mr. Henderson is a lawyer by training and practice.

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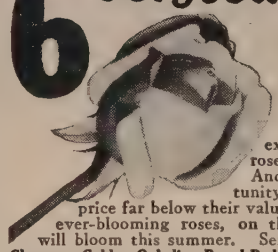

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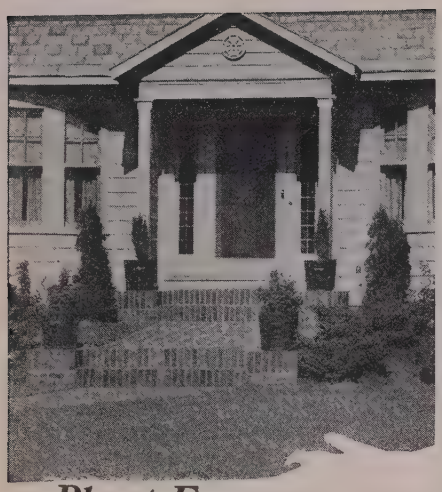

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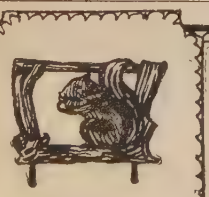

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DANIEL N. POMEROY, Lockport, N. Y.

A Hanging Incident

It was the custom to open the biology classes at Harbor High School, Ashtabula Harbor, Ohio, with reports from Nature Magazine, writes L. A. Sprague, now principal of the Hubbard, Ohio, High School. One day, however, the incident described below took place and consumed the entire session of the class. Afterward each one of the members was asked to describe the incident. The five best descriptions were passed upon by another class and Paul Bugbee was adjudged the winner. His version was:

"Suddenly an English sparrow was seen suspended in the air. There was a great commotion in the class as all hearts poured forth sympathy for the little fellow.

"In making his nest under the eaves of the school building (adjacent to the building we were in), a piece of twine about two feet long had accidentally caught on the tip of his wing. Upon flying from his nest he was undoubtedly very much surprised upon finding himself suspended in mid-air. However he did not become discouraged but kept trying to free himself. He would flop back and forth until he could swing himself high enough to perch on a cross section of spouting to rest. Then he would try to pull the string from his wing. In doing this the string encircled his neck. Thinking that he was free he tried to fly but found himself in a worse predicament than before.

"Everyone was sorely distressed at watching the little fellow hanging at the end of a string and apparently choking to death. Again and again he tried to reach the spouting and failed. After several attempts he did succeed. This time his mate came to the rescue. She tried to pull the string from the tip of his wing, but failed. She then tried to pull the string from its place of attachment to the nest. She failed in this but in all of this pulling he was pulled from his resting place and again suspended in mid-air. After several attempts he again managed to pull himself to the spouting. The string was by this time beginning to fray and the next time the bird was in the air by a last hard pull, the string broke. After falling a few feet he regained his bearings and glided into a nearby tree to rest.

"My! what a relief came over all members of the class."

A Correction

We regret the statement appearing in "Tree Siamese Twins" on page 16 of the January issue, to the effect that old-timers can remember when

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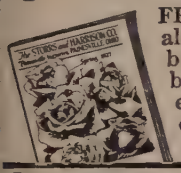

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the tree-arch pictured, now over seven feet high, measured only about three feet. This is out of agreement with the well-established principles of tree growth, and is almost certainly an error. Under certain circumstances, however, an apparent lengthening or lifting of the trunk of a tree may occur. A correspondent, W. C. Egan, gives such an example, as follows:

"A dam was built to a height of the lower branch of a tree growing on the bank near one end. In the permit to build the dam was a provision that in case the dam was destroyed and rebuilt it should be no higher than the branch mentioned above. It was destroyed and rebuilt, but the land above it was flooded, as the dam was evidently higher than before. Upon examination the roots of the tree were found to rest upon solid rock. Roots thicken as well as trunks and branches, and resting on solid rock force the whole tree upward."

Mammalogists to Meet

Members of the American Society of Mammalogists will hold their ninth annual meeting April 27 to 29 at the Academy of Natural Science in Philadelphia. Motion pictures, the reading of scientific and popular papers, a banquet and a tour of the zoological part are on the program for the meeting. The headquarters will be at the Robert Morris Hotel, Seventeenth and Arch Streets, and members are urged to make reservations in advance.

National Park Creed

Nature Notes of Grand Canyon National Park for December have on their outer sheet a National Park creed written by John C. Merriam, president of Carnegie Institution of Washington for the National Parks Bulletin. The creed states:

"While the National Parks serve in an important sense as recreation areas, their primary uses extend far into that fundamental education which concerns real appreciation of Nature. Here beauty in its truest sense receives expression and exerts its influence along with recreation and formal education. To me the parks are not merely places to rest and exercise and learn. They are regions where one looks through the veil to meet the realities of Nature and of the unfathomable power behind it.

"I cannot say what worship really

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is—nor am I sure that others will do better—but often in the parks, I remember Bryant's lines, 'Why should we, in the world's riper years, neglect God's ancient sanctuaries, and adore only among the crowd, and under roofs that our frail hands have raised?' National Parks represent opportunities for worship through which one comes to understand more fully certain of the attributes of Nature and its Creator. They are not objects to be worshipped, but they are altars over which we may worship."

Mixed Motherhood

On the same day the family dog presented the world with five puppies and the cat a litter of kittens, writes Sibley Merton of Clayton, Missouri. Being such a large menagerie, the two families were cut down to a pup and a kitten each, but mother cat, old and sick, passed into cat heaven. Lobo, the dog, had been brought up with mother cat so the motherless kitten was given to a foster parent. Side by side the pup and the kitten dined at Nature's fount, playing together and sleeping together and finally growing successfully to doghood and cathood.

Save "Cascade Corner"

A plea is made by the American Civic Association with headquarters at Washington, D. C., that immediate appeal by telegram or letter, be made to the Chairman of the Public Lands Committee of both the Senate and the House, or to any member of these Committees who may be known personally, in an effort to defeat an amendment to Bills S. 3427 and H. R. 9917. This measure proposes readjustment of the boundaries of the Yellowstone National Park, and would permit the withdrawal of twelve square miles known as the "Cascade Corner" to be used as an irrigation project for Idaho. It is claimed that this would involve the flooding of his area, would cut off access to the waterfalls, cascades and canyons, which form so important a part of this unspoiled wilderness. It is further contended that there are other reservoir sites which might be purchased from private owners by the State of Idaho for this purpose.

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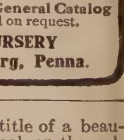

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Poison Oak Remedy

A remedy for poison oak poisoning worked out by Dr. J. B. McNair of the University of Chicago is called to our attention by Effie G. Garrett of Los Angeles. The formula calls for a five per cent solution of ferric chloride in a half and half solution of alcohol and water or glycerine and water. Bathing the face and hands in this solution either before or immediately after leaving a region where poison oak or poison ivy is found is said to constitute a fine preventive of discomfort.

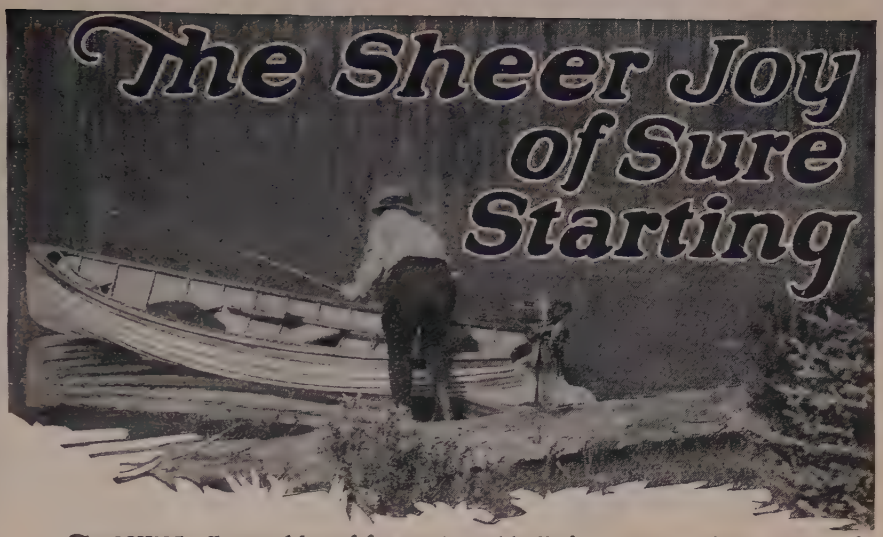
Mocking Bird Appetites

By M. F. Baker

A Brazilian shrub, the feijoa, of the myrtle family, is remarkable for its sweet-tasting petals, which in the plant's native country are eaten by certain birds that are believed to aid in cross-pollinating the flowers. This shrub is occasionally planted in Florida. For three years the feijoas in my garden have been beautiful during April and May, bearing a profusion of flowers with many long, crimson stamens, and peculiar, boat-shaped, purple and white petals. Last spring the flowers were as conspicuous as usual for two weeks; mocking birds then suddenly begin to eat the fallen petals. Soon the birds took petals from the open flowers, and by early May were tearing off and eating all the petals before the flowers could fully open—an activity that was more interesting than agreeable to the owner of the shrubs. This seems to be a new experiment for our Florida birds. Mr. Wilson Popenoe, in his delightful "Manual of Tropical and Subtropical Fruits," states that: "In the United States the birds which do this work in the habitat of the feijoa are not present."

Betelgeuse Shrinks (?)

The star named Betelgeuse, famous two years ago as the first star to have its measure taken by the apparatus of Professor Albert A. Michelson, at Mount Wilson Observatory, in California, seems to have gone on a diet and shrunk. According to an announcement from the Harvard Observatory, Mr. Frank E. Seagrave, of North Scituate, Rhode Island, has discovered a slight decrease in the brightness of the star. One other star which was also measured by Professor Michelson's apparatus is the star called Mira, or "The Wonderful." This star is known to vary in brightness from time to time. The measurements proved that it also varies in girth. It is really a vast pulsating globe of gas, as though it



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were a beating heart. Betelgeuse, which is the brilliant reddish star at the shoulder of the constellation Orion, has not been known to vary either in brightness or in diameter but the new observation suggests that perhaps it does. Betelgeuse is not a small and relatively dense star, like our sun, but is a vast globe of very thin gas, far thinner than a gas flame. Its size is so great that the entire orbit of the earth, in which we move around the sun, could be contained inside its gaseous globe.

Simple Bird Homes

"One spring morning as I entered the garage," writes William Mason Allen of Laurel, Maryland, "I heard a wren having an argument with herself as she sat in a knothole up near the roof. She was apparently searching for something. As it was nesting time, I concluded she was househunting and to help her along I took an empty tomato can, drove a nail through the edge and fastened it over the knothole. In less than a half hour the wren family had signed a lease and were moving in. Other such impromptu nests have been occupied each year. Recently we had a bird-lover as a guest and she heard or saw forty-eight varieties of birds about our home in three weeks, even before the spring migration was over." So much for the discarded tomato can.

How a Cat Falls

Everyone knows that when a cat falls it will turn over in the air and land on its feet, usually without injury. Recent scientific studies of the nerve messages called reflexes have disclosed how this useful accomplishment is brought about. An English physiologist, Dr. F. M. R. Walshe, described in a recent lecture facts learned about falling cats by taking slow-motion pictures of the fall. It is found that the cat's head is the first part of its body to take on the new and safer posture. The head twists with reference to the body, so that the head is right-side-up. This righting of the head has been traced, Dr. Walshe reports, to a nervous reflex originating in the three small liquid-filled semi-circular tubes in the inner part of the cat's ear. These same tubes serve as "levels" for the human body, warning us whenever our head is tilted. A nervous impulse from these three tubes notifies the cat's head that it is upside down. The neck muscles instantly twist it around. There then follows, the motion pictures show, another set of nervous reflexes begun by the tension of the

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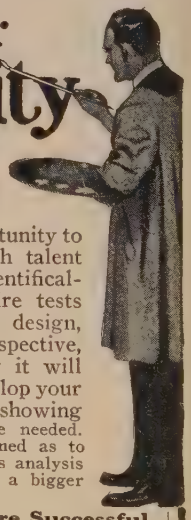

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eck muscles. These start the body uscles into motion, so that the whole dy of the cat is righted and lands ght-side-up. All of these nervous eflexes are involuntary, unconscious nd practically instantaneous.

Add Nature Columns

Some friend has sent in two copies f *The Cadiz* (Ohio) *Republican* to ll to our attention another Nature olumn to be added to those we have ready mentioned, beginning with m Borland's column in the *News-erald* of Franklin, Pa. Anonymity nshrouds the author of the column this Ohio weekly, which, incident-ly, is entering the fourteenth year f its second century of existence. he title of the department, which is iven first page position, is "News rom the Woods and Fields." It is ritten by an observer with a fine ense of appreciation of Nature. A ew more such columns and we can nsider forming a National Associa-on of Nature Column Conductors. Ve hereby announce our support of im Borland for president and J. Otis wift for secretary.

A Climbing Weasel

Much has been written about hether or not weasels climb, appar-ntly without much direct evi-ence. We are therefore gratified to eceive a note from W. H. Moore, he veteran naturalist of Scotch ake, New Brunswick, noting an in-tance where the Bonaparte weasel *(Mustela cicognanii)* was observed n the act. Mr. Moore writes:

"My son was doing some work in nearby woodlot when his attention vas attracted to a weasel in white vinter pelage hunting about in the nderbrush. He saw the weasel limb four trees to distances of from ive to twelve feet. The trees were irch, beech and fir, smooth-barked nd entirely free from limbs for nany feet up. In each case the ani-nal descended head foremost like a ed squirrel."

An Apple-Tree Tragedy

By Hiram Blauvelt

I have always investigated bird-ests with an insatiable curiosity to tudy what unusual homelife condi-ions might there exist, but never be-ore or since have I ever discovered more extraordinary and pathetic est than early one fall when as a oy I shinned up a big apple-tree in n old orchard behind the farm-house o peep into a chipping sparrow's nest hich lay securely nestled near the nd of a limb in a circle of small ranches that held it like the crooked

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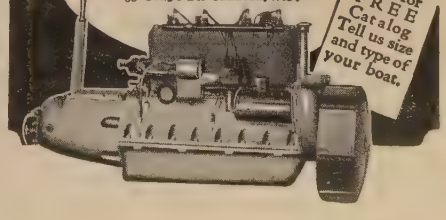

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fingers of a cupped and up-turned hand. I expectantly parted the foliage to look in. There, to my surprise, was a half-grown apple in the neat horse-hair hollow of the little nest, where it had evidently dropped, loosened prematurely by the wind. I lifted the apple out and, lo and behold, beneath it were the tiny crushed skeletons of four little nestlings. The apple which fitted the inside of the nest exactly must have been there two or three months at least, if not longer. I remember I sat there in the tree-crotch dazed and almost cried with pity at the thing. Then I carefully put the apple back—it would be a tombstone to the four little lives buried in mid-air between earth and sky beneath it—quietly slid down the tree and went my way. It made a profound impression on my boyish mind. I have often wondered if anyone else has ever found a nest of birdlings smothered under a piece of fruit fallen from the very tree in which the parent birds had built their nest for protection. This is the most unusual nest I have ever found and I have never forgotten it.

Educating A County To Nature Study

By FRED ZIEGLER, JR.

Inauguarating the custom with the following article, NATURE MAGAZINE will be pleased to publish each month a similar article about one Nature Club. It is felt that these brief reviews will be, in future years, somewhat historic in character. These articles should not exceed the following in length and they will be published in the order of their receipt in this office.

Franklin County, Pennsylvania, boasts of an organization which is, perhaps, without parallel among Nature study societies. This organization is The Franklin County Nature Club with headquarters at Greencastle, Pennsylvania, a town honored in the past six years by the presence of many of America's leading naturalists.

Nearly twelve years ago a number of boys organized the "Greencastle Nature Club," active membership in which was open to any youngster who could pass an examination prepared for him and who was personally acceptable to all the charter members of the club. The work consisted entirely in the identification of birds and the collection of bird nest data.

The little club managed to keep together for more than five years; its members were for the most part genuinely interested in Nature study. By the spring of 1920, however, the majority of its members had drifted away, and on October, 23, 1920, a group of fifteen met and saw the Greencastle Nature Club become the

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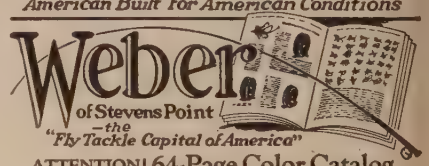

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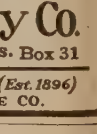

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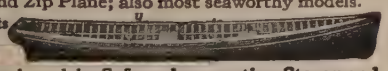

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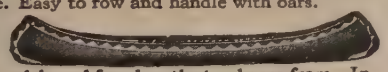

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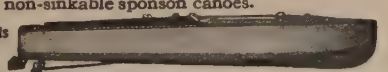

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Franklin County Nature Club. Membership in the new organization was thrown open to any person in the county who might be interested in Nature study, and the original plan of bird study was extended to embrace the study and protection of all valuable forms of wild life.

The new club adopted a threefold slogan: Observation, Education, Preservation. It encouraged its members to engage in active field work, making use of glass and camera. By publishing bulletins in the county papers and by arranging a yearly schedule of lectures it undertook a vigorous campaign on behalf of Nature study. It exerted its influence consistently for the humane treatment of animals and for the preservation of beautiful and useful objects.

By far the most remarkable feature of the club's history is the series of lectures which it has sponsored. Using its annual dues entirely for securing good lectures, and giving its members the benefit of half-price admission, it has to date conducted nearly thirty lectures, attended by Nature lovers from all parts of Franklin County. The lectures are usually held in the high school assembly room and the general public is invited to patronize them. Dr. Witmer Stone, curator of the Academy of Natural Sciences, Philadelphia, was the first celebrity to speak before the club, and much of its subsequent growth is attributable to his kindness in responding to the call of the executive committee in those early days. Others who have journeyed to Greencastle to address the club are Ernest Thompson Seton, the late Ernest Harold Baynes, Dr. A. A. Allen, Garett P. Serviss, Dr. George Clyde Fisher, Charles Crawford Gorst, Prof. Archibald Rutledge, and William L. Finley. Officials of various Pennsylvania bureaus have also appeared before the club. Nearly all the lectures have been illustrated, the club having purchased its own lantern for the purpose.

The Franklin County Nature Club now has an active membership of more than one hundred and fifty. In its ranks are boys and girls in their teens, and men and women of every profession. True to its purpose, it is trying to point the way to a more thorough enjoyment of life and is encouraging a spirit of kindliness toward all living things.

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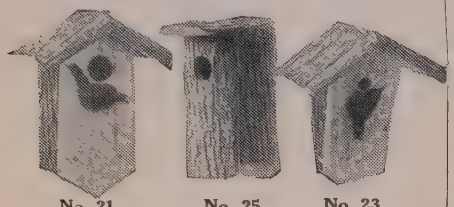

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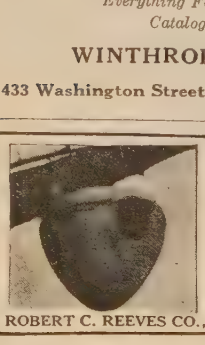

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A Balancing Act

PHOTO MILFORD ZORNES

A balanced rock on Lightning Creek near Garden Valley, Idaho. It stands twenty-five feet high and rests on a base of about one square foot. It is of granite formation and its shape is caused by the decomposing of the material and the action of the elements.

Another Nature Column

Another candidate for membership in the Association of Nature Column Conductors that we proposed in the March issue is Joe Jones of Berryville, Virginia. The *Clarke Courier* of that community runs under the head of "Our Nature Column," Joe's writings, which are full of the enthusiasm of a youth in love with Nature. Joe is, indeed, a youth, being in his last year in the Berryville High School, but we predict that, if he follows the path he has started to clear with this column, he is going far in the field of Nature writing,—a field now distinguished by the names of Sharp, Sass, Beebe, Lampman and a few others, and one whose ranks must be recruited up with coming young men. We congratulate the newspaper on having Joe, and Joe on having the newspaper through which to express himself.

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Skunks for Pets

Fishing was good about the camp in northern Wisconsin, writes Margaret P. Schmidt, and the leftovers after cleaning the fish attracted visitors in the form of skunks. Gradually these little fellows became tamer and

PHOTO FRANK SCHMIDT

tamer, rubbing themselves against our legs as they waited for scraps of food. Little attention was paid to them and they seemed to enter into a spirit of comradeship, showing no fear and delighting when the boys reached down to pet them or scratch their backs. There never was an instance of an unhappy experience with these wood-pussy friends and the boys carried home a happy memory of their little woodland friends. One of the boys shown here has a baby skunk, found nearby, in his hand.

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Questions and Answers

The American Nature Association will be glad to answer each month such questions as its members ask about Nature.

QUESTION: *How far do storms extend below the surface of the ocean?—L. H.*

ANSWER: Storms do not disturb the water beyond a few feet of the surface.

QUESTION: *Is it dark in the bottom of the ocean?—L. H.*

ANSWER: Yes, it is dark in the ocean depths.

QUESTION: *Will you please tell me if the meteoric showers occur at about the same time each year? Also how many there are, when to look for them, and their names.—L. W. T.*

ANSWER: Scattered meteors occur at any time, but there are showers of them which come annually at certain times. About the 9th to the 11th of August appear the Perseids. About November 15 come the Leonids. Two other groups which come at intervals many years apart are the Andromeds in late November or early December, and the Lyraids, about April 20, supposed to be attendant upon comets.

QUESTION: *Why don't flowers all have the same fragrance?—L. H.*

ANSWER: The variation in the scent of various flowers is probably just a part of Nature's love of variety.

QUESTION: *Is a hornet merely another name for a wasp?—L. H.*

ANSWER: Hornet and wasp are practically synonymous.

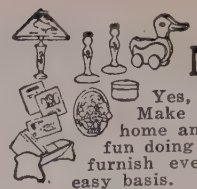
QUESTION: *Can you tell me what bird, about the size of a crow, makes a noise similar to a cat?—M. L. J.*

ANSWER: The only large bird that we can think of that makes a noise like a cat is the Magpie, a large black and white long-tailed bird common over much of the west.

QUESTION: *Will you please tell me the common and scientific names of the snake "Adelaide," which came from Santo Domingo, which you feature on pages 361 and 362 of December Nature Magazine?—C. F. K.*

ANSWER: Miss Doris Cochran of the U. S. National Museum, who is personally acquainted with "Adelaide," tells us that her scientific name is *Tropidophis maculata haetiana.* The only available common name is Santo Domingo Boa.

QUESTION: *Will you tell me the name of the worm-like organism which was obtained from the water-spigot, having come from the mountain side through the water mains. It is twelve inches long, cylindrical, tapering at the ends, color light brown, somewhat resembles copper wire, and is about the size of the "lead" in a lead pencil.—C. E.*



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ANSWER: This is undoubtedly one of the Hair Worms, family Gordiidæ, commonly supposed by the ignorant to result from a horsehair being left in water. These creatures pair and produce eggs, which hatch into a larval form very different from the adult. These bore into the body of an insect, sometimes a grasshopper, but usually a water-inhabiting species. Here it lives for some time. If the insect is eaten by a fish, the development of the worm is completed within the fish.

QUESTION: *Would you advise me to take a young bird from its nest and try to raise it? J. C.*

ANSWER: No, we would by all means advise you *not* to take any young birds away from their parents for the purpose of raising them. That is a process that the mother understands much better than you do; and she will doubtless make a better job of it. If the birds nest about the home grounds it will probably do no harm for you to watch them, without going *too* near. Some parent birds become very tame and confiding when they learn that you do not mean to harm them. But going to nests in the fields and woods often leads to their detection by animals that follow your trails, and results in the destruction of the bird family.

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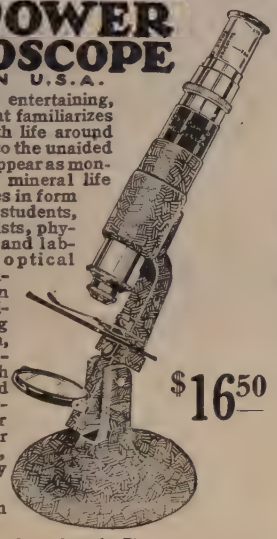

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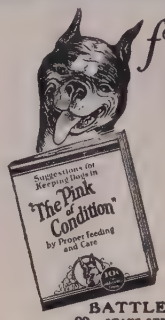

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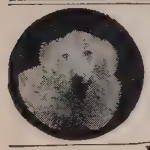

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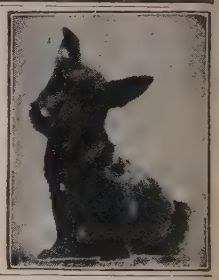

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URGES NATION TURN TO FORESTRY

Report of Research Committee Just Published Points to Country's Needs

Covering the needs of the grower of timber as well as the producer of lumber and other forest products a National Program of Forest Research is published by the American Tree Association for the Society of American Foresters. The publication outlines what is being done in forest research in France, Great Britain, Germany, Austria, Sweden, Finland, Norway, Switzerland, Belgium, Netherlands, Canada, India, Union of South Africa, Italy, Russia, and Australia.

"This country must give its best thought to where its future timber supply is coming from," says Charles Lathrop Pack, president of the American Tree Association, in an American Forest Week statement. "The ideal economic situation would be that where the millions of idle acres close to the points of greatest consumption, our manufacturing centers, were at work growing trees. Idle acres are as great a menace to prosperity as idle men."

Expenditure of from $9,000,000 to $12,000,000 a year for forest research by Government agencies, institutions and the forest industries is urged by the committee of foresters in the report which gives much to think about during American Forest Week, April 24.

S. T. Dana, director of the Northeastern Experiment Station, Amherst, Mass., calls attention to the disparity between the scant $2,600,000 now spent by all agencies for research in connection with our 470,000,000 acres of forest land, the $18,000,000 spent for agricultural research relating to our 500,000,000 acres of improved land, and the 100 to 200 million dollars a year invested in industrial research.

According to Mr. Dana this is the first attempt to estimate on a nation-wide scale what science has attained in the solution of our forest problems and what it must undertake.

The report was prepared by E. H. Clapp, in charge of the branch of research, United States Forest Service, chairman of the society committee, the other members of which are R. C. Hall, formerly valuation engineer in the timber section, Bureau of Internal Revenue, and A. B. Hastings, until recently Assistant State Forester of Virginia.

The committee lays special stress upon the need for a broader view of forest research. Such a view includes not only the important problems of forest management and wood utilization but also the correlation of these with such basic studies as the physical nature and chemistry of wood, the influence of growth conditions, the strength and other properties of wood, the fields of forest soils, forest-meteorolgy, forest entomology and pathology, and also forest economics.

An idea of the task, says the committee, can be measured by the size of the area on which timber must be grown. This exceeds by about 140,000,000 acres the forest area of all Europe except post-war Russia. It is about one-fourth larger than the area of tilled land in the United States devoted to agricultural crops.

Complexity of the problem is indicated in the great diversity of forest conditions in the United States. Our forests range over a maximum distance of 1,600 miles north and south and 2,800 miles east and west. They range in altitude up to 6,700 feet in the East and 12,500 feet in the Sierras of California. Climatic conditions may be anything from sub-tropical to sub-arctic and are influenced by the Labrador current in one instance and by the Japan current in another. Precipitation ranges from 20 inches a year to 140 inches. As for soils, one of the most important of the many studies of forest conditions, probably no one knows the number of soil types within this continental area and the wide range of their influence upon forest growth.

Contrast between Europe and America in this respect is emphasized. Whereas Europe boasts of a total of some 30 arborescent species of which seven or eight are of first commercial importance, this country has 850 distinct species, of which at least 65 are of first commercial importance. All of these species differ in life processes, life histories, and requirements of soil, moisture, climate and light, in their susceptibility to fire, insects, and disease, and in their reaction, cultural operations.

Such a complication of problems, of which some solution must be found if our forests are to meet the growing needs of this country, deserves, in the opinion of the foresters' committee, greatly increased personnel and equipment.

Increased expenditures for research, the committee believes, are amply justified by our national requirements, but an additional justification appears in the large appropriations for research made annually by industrial concerns of no greater magnitude than the United States industries and also, in fact, that about $18,000,000 is now spent each year by Federal and State Governments on agricultural research for the benefit of an area of improved land only slightly greater than our 470 million acres of forest land.

Of the $9,000,000 annually which the committee regards as necessary to cover the work of all forest research agencies by 1936 it is estimated that two-thirds would be contributed by the forest industries, state agencies, and endowed institutions and the remainder by the Federal Government.

An endowed Forest Research Institution is one of the needs foreseen by the committee. Such an institution with an annual income of about $1,000,000 would be in a position to carry on fundamental, long-time research profects such as other organizations have neither time nor facilities to undertake.

Credit is given by the report to industrial and other organizations for accomplishments in forest research to date, but not without considerable emphasis on the tremendous breadth of the field yet to be covered. The committee feels that all agencies now at work may greatly increase their efforts and scope of effort in so wide a field. The need for a constructive national program at this time is urged as imperative for the well-being of the lumber industry and of all others dependent upon ample timber supplies.

AMERICAN FOREST WEEK FACTS

There are 81,000,000 acres of idle land in the United States that are fit for nothing save to grow timber.

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Industry uses 20,000,000 cubic feet of timber every year in mining and excavation operations. Approximately 5,000,000 trees must be cut each year to supply the demand for telegraph and telephone poles. Estimates show that we use about 500,000,000 fence posts in this country every twelve months.

Railroads require some 3,000 ties to the mile, and all the railroads of the United States use about 125,000,000 new wood ties every year. The annual demand of the cooperage industry is for 250,000,000 cubic feet of wood. At least a billion lead pencils are consumed in a year, and that means quite a "jag of wood," as the farmer would say when he starts out to his wood-lot.

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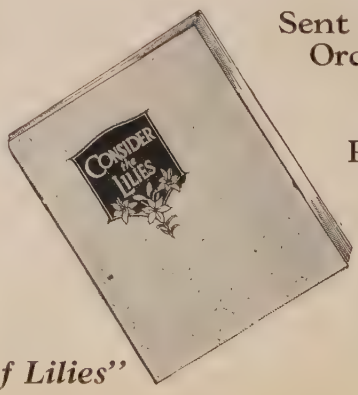

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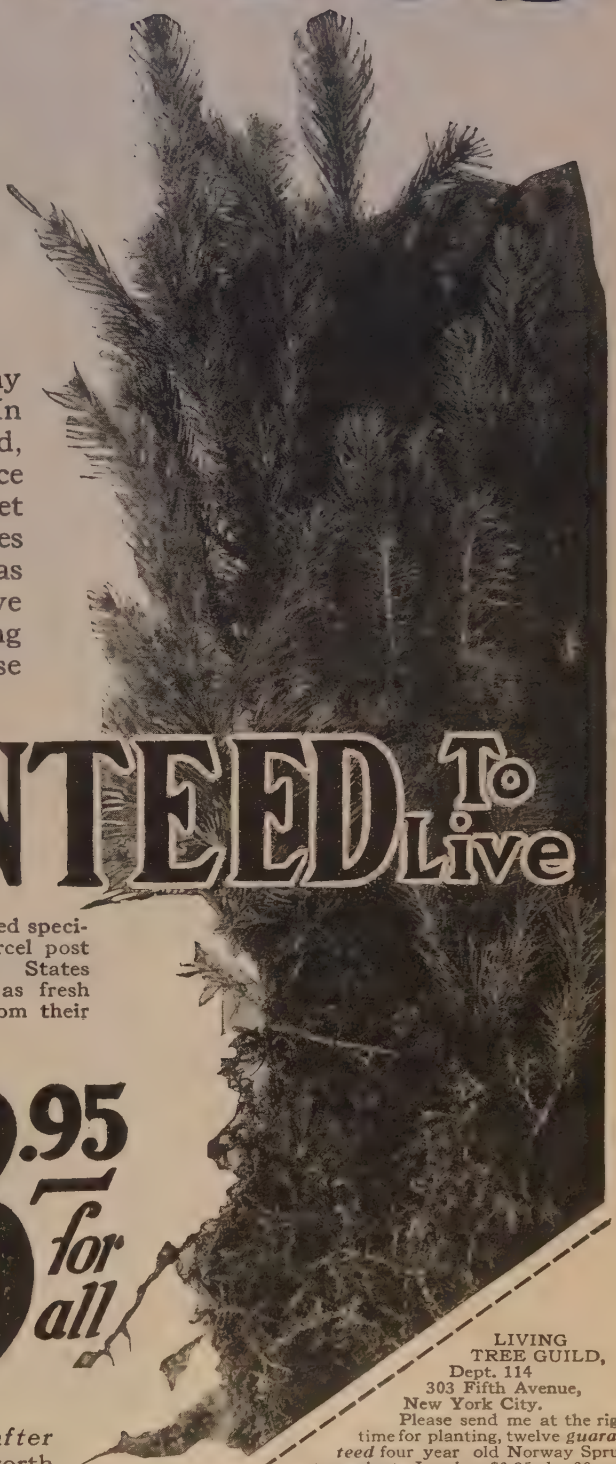

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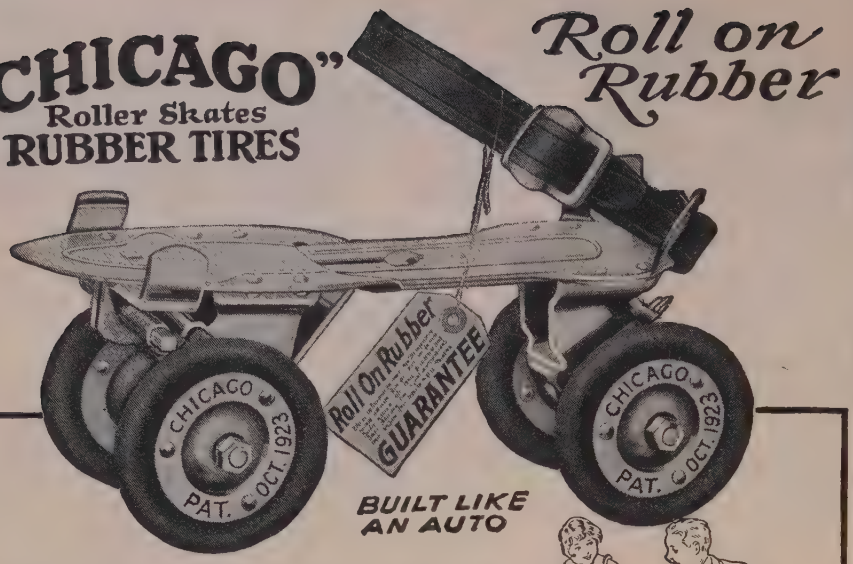

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Our Contemporaries

Solution of the Surf-Bird's Secret by Joseph Dixon of the University of California is the subject of the leading article in the January-February issue of *The Condor*, the publication of the Cooper Ornithological Club. It is the story of the trip to Alaska that was crowned with sucess upon finding the nest and eggs of *Aphriza virgata*. The article is illustrated by a four-color painting by Allan Brooks and halftones. Articles in this issue include The Calliope Hummingbird by Winton Weydemeyer; Eye Shine in Birds by A. J. Van Rossem; Birds of Scammon's Lagoon by Griffing Bancroft.

The January issue of *The Auk*, quarterly journal of the American Ornithologists' Union, also goes to Alaska for material for its leading article, which is entitled Notes on the Birds of Southeastern Alaska by Alfred M. Bailey. Material on The Rubythroat Hummingbird is contributed by Andrew L. Pickens. Other articles include: The Colorado Sparrow Hawks by W. H. Bergtold; Summer Birds of Southwestern Kansas by Jean Linsdale; Birds of the Labrador Peninsula by Harrison F. Lewis; Six New Subspecies of Birds from Lower California by Joseph Grinnell.

Dr. A. Brooker Klugh has the leading article in the February *Journal of Mammalogy*, quarterly of the American Society of Mammalogists, and devotes it to the red squirrel. Other articles cover the Alaska Red Squirrel by Olaus J. Murie; Prairie Dog by E. C. Cates and Ground Squirrel by Frederick L. Hisaw and Frederick E. Emery. It is a squirrel number.

Willard N. Clute reports on a new frost-flower in the January issue of his *American Botanist*. Donald C. Peattie is contributor of an article on Prep. ation of a Local Flora, and T. Hay of London, England, writes on The Mulleins. There are the usual interesting notes and comments.

From the Los Angeles Museum comes a new contemporary in the *Museum Graphic*, to be published bi-monthly except during July and August. It is edited by William Alanson Bryan, attractively printed and illustrated and devoted to articles on the museum work or arising out of its work. The annual subscription is $2.50.

Elementary Science

That Elementary Science is gradually coming into its own in progressive schools cannot be questioned. The new course of study in Elementary Science from the Cleveland Public Schools is a concrete example of increased interest and belief in the subject. Departmentalization in the fourth, fifth, and sixth years is advocated. A minimum time allotment of thirty minutes a week is set up, with the suggestion that teachers continue to use factual ma-

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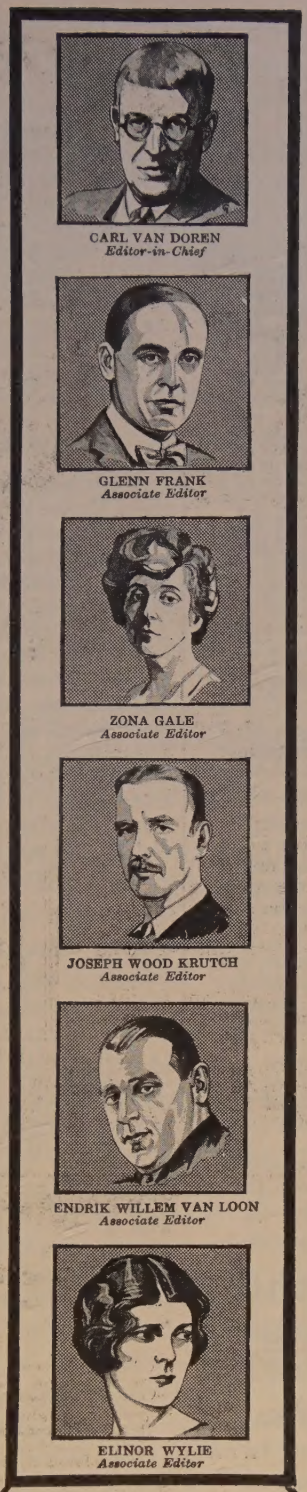

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The public is enthusiastic. We cannot give you here a list of the names of all the subscribers who have joined. Here are a few among the first.

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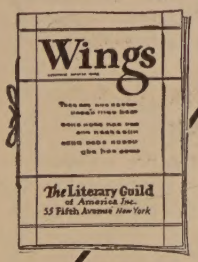

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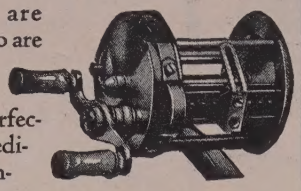

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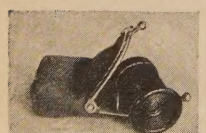

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More Wild Flowers
In May Issue

terial from this course in connection with arithmetic language, and reading. Objectives, activities, visual materials, and references for pupils and teachers are given.

Whether aims in science teaching can be arbitrarily limited to specific years, as is done in this outline, whether most aims are consciously or unconsciously fulfilled in every year's work, on the level of the child's growth in that year, is a question which educators and psychologists might discuss lengthily. Whatever the answer, the Cleveland course is both helpful and delightful. Nature teachers everywhere will find it worth study.

Mr. Richard Kearton

A life-long naturalist, a noted lecturer, and a Nature writer of distinction, Richard Kearton now gives a delightful new Nature book under the title *A Naturalist's Pilgrimage* from the presses of Houghton Mifflin Company of New York and Boston. As those who know his earlier writings realize, Mr. Kearton is an English naturalist and in this last autobiographical volume he takes his reader from Yorkshire to many lecture platforms and concludes with a fascinating chapter on hunting birds with Theodore Roosevelt. The entire book is entertaining reading strengthened by a seasoned philosophy of one who has known Nature well and profited by the lessons she teaches. The price is $2.75.

Backdoor Neighbors

Frank C. Pellett is perhaps chiefly known for his work and writings in the field of bee culture but his interest and ability as a naturalist has never stopped there. *Our Backdoor Neighbors,* the second edition of which comes from the Abingdon Press, 150 Fifth Avenue, New York City, is sufficient testimony to this fact. This little volume, which sells for $1.50, is a collection of short stories of fact about wild friends of the author and his family. Not only are they entertaining as reading matter but they are truly informative and enjoy the advantage of excellent illustrations taken by the author.

On Boston Terriers

Owners or prospective owners of Boston terriers should find a booklet on the care, feeding and general upbringing of this dog, written by Rose P. Kinne of Yakima, Washington, extremely helpful. The pamphlet is quoted by its author at a price of one dollar.

Captured Sunsets

One can hardly hope to capture sunsets on the black and white of a photographic print nor imprison them in the poor words that we have to describe them. Nevertheless Dr. William L. Stidger set out to do this and travelled over many seas and into many lands in his quest. In a little one-dollar book printed by the Abingdon Press, 150 Fifth Avenue, New York City, and called *A Book of Sunsets,* the author has succeeded amazingly well. "From the

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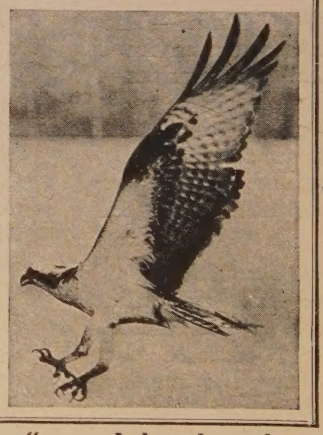

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decks of ships, from the wide windows of tropical bungalows, from jungle trails, from the tops of ancient temples and the rims of old volcanoes I have seen Him at work upon the canvas of the sky." This gives an inkling of the scope of the attractive little volume.

A companion volume to this is *A Book of Clouds* by William A. Quayle, also printed by Abingdon. Bishop Quayle's reputation as a writer needs little commendation here and he imparts this ability to the clouds he has always loved and sought to understand. The book is beautifully illustrated. It is quoted at $2.50.

In the Rockies

In *Animal Tales of the Rockies* the author, Albert Benjamin Cunningham, has gathered six fascinating wild life stories into a small volume brought out by the Abingdon Press, 150 Fifth Avenue, New York City. They are human interest stories that stand out from the ruck and make entertaining reading. The book is listed at one dollar.

New England Winter

Winters in New England need no word to add to their reputation for severity. They imprison many away from the world, set them off to their own meditations, to be amused by their own devices. This is the theme of *Winterwise* by Zephine Humphrey, published by E. P. Dutton and Company, 681 Fifth Avenue, New York City. It is not essentially a Nature book and yet it is, because it is inspired by that boisterous phase of Nature—winter. It is a series of delightful letter-essays about this and about that, but all the while there is winter, snow, tumbling thermometers in the background giving the atmosphere of leisurely solitude in much the way another element depressed in the play, "Rain." There is no similarity between this book and that play, of course, beyond the use of one of the elements. It is good reading and stimulating. The price is $2.50.

Science "Work Book"

A recent publication of interest to General Science teachers is *My Work Book in General Science* by E. C. and K. M. Persing, Harter School Supply Co., publishers. The aim of the book is to give a self-directed study course for the individual. It is intended to reduce the routine work of the teacher, and, at the same time, help the pupil to become more self-reliant and responsible through stimulating him to think for himself. Individual differences are provided for to the extent that each student may proceed at his own rate.

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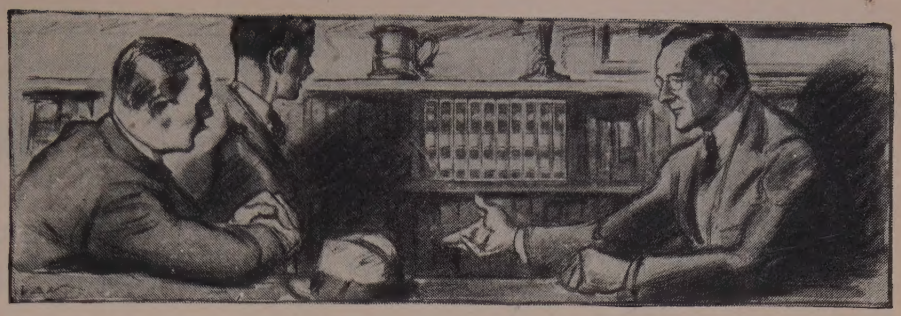

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April, 1927

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